Networks and the Evolution of Morality

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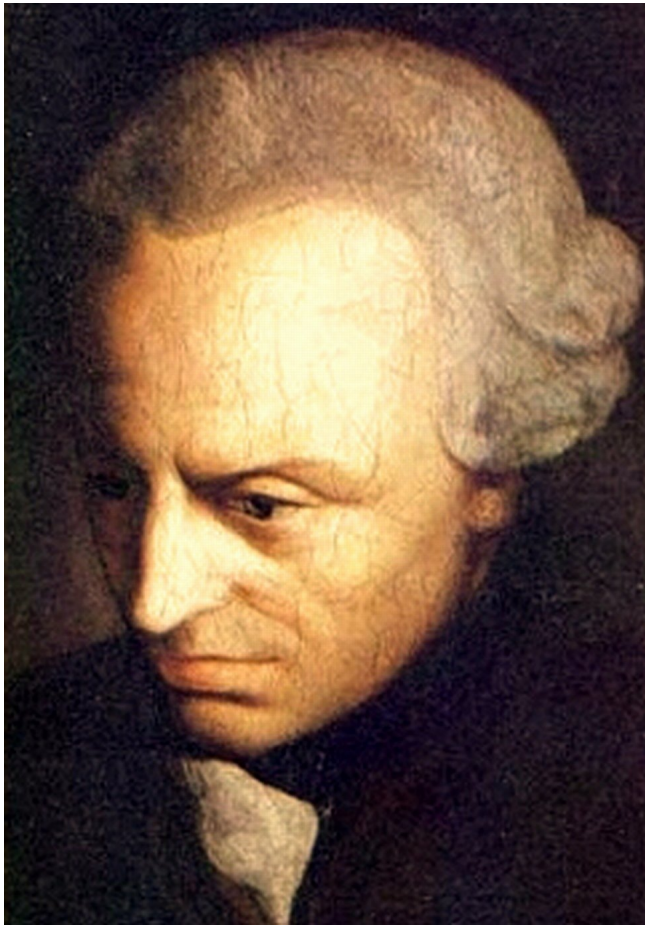
Morality

Whence moral judgments?

Kant

- All of morality comes from reason
- We find it via reflection



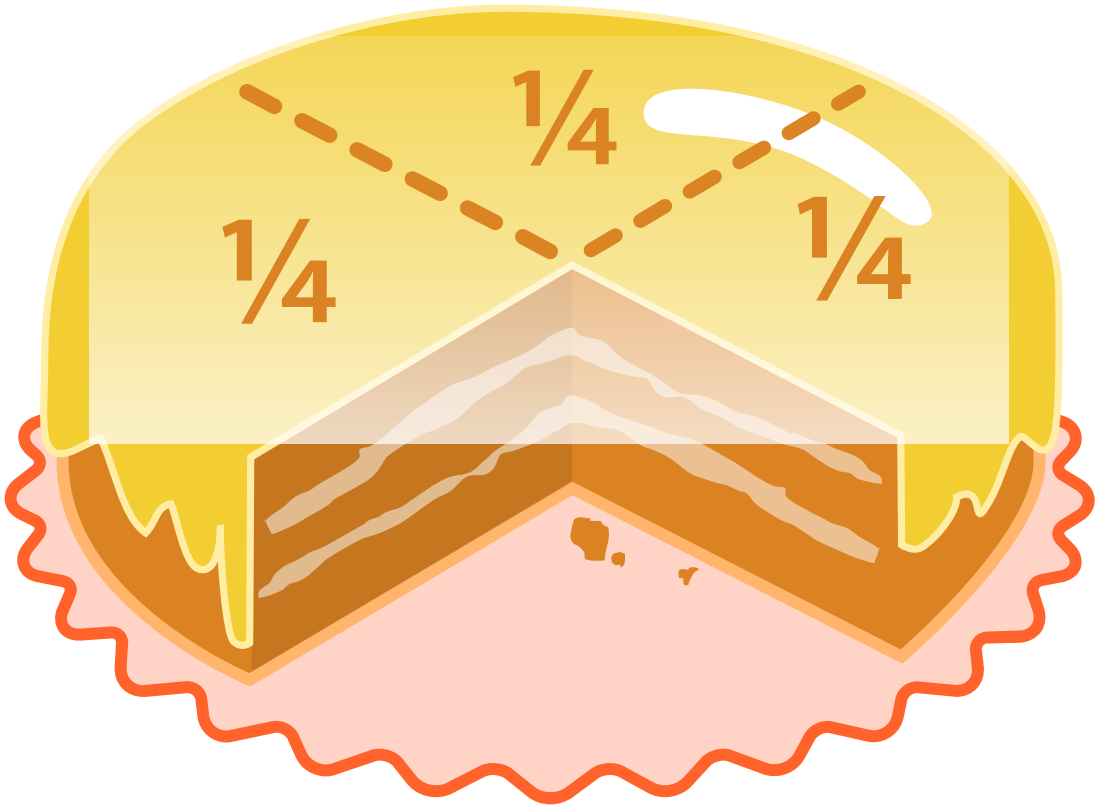
Hume

- Much of morality is conventional
- It was created to ensure mutual benefit

Hume

"Justice take its rise from human conventions and … these are intended as a remedy to some inconveniences..."

Fairness

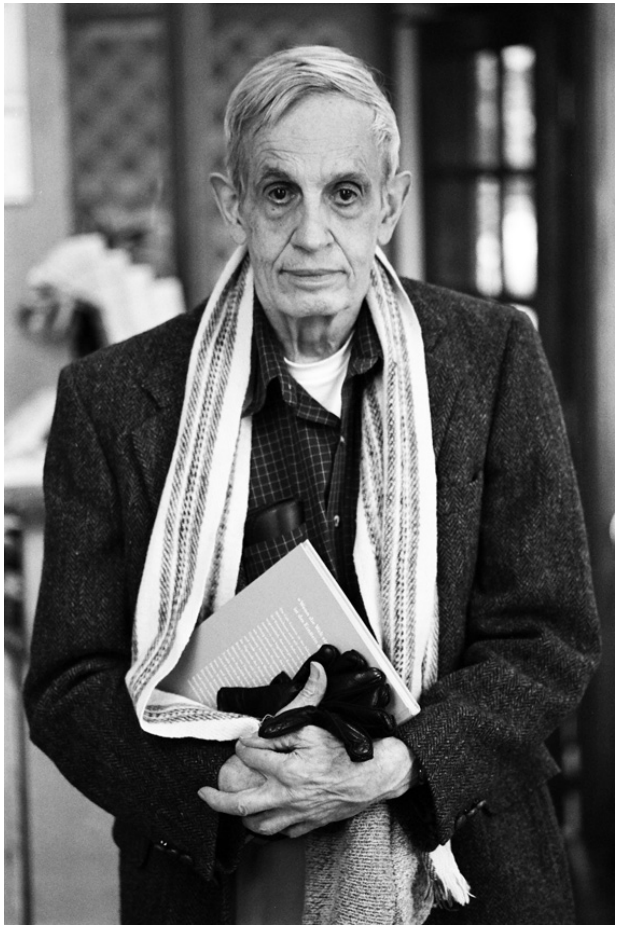


Morality

- Kant
  - *Categorical Imperative:* Any principle you use must be consistent with everyone using that principle
  - Asking for at most ½ can be universal, but asking for more cannot
- Hume
  - We develop norms to handle this situation over time
  - After a while those norms become so ingrained they seem like they are the only rational solution

Nash and Hume

No outcome is “stable” where someone stands to gain by changing their behavior



Nash and Hume

- Suppose that one person demands x and the other demands y.
- If $x + y > 1$ …
  - Nobody gets anything and the players gain by lowering their demands
- If $x + y < 1$ …
  - There is cake left over, and somebody gains from increasing her demand
- If $x + y = 1$ and $x, y > 0$…
  - Nobody gains by switching

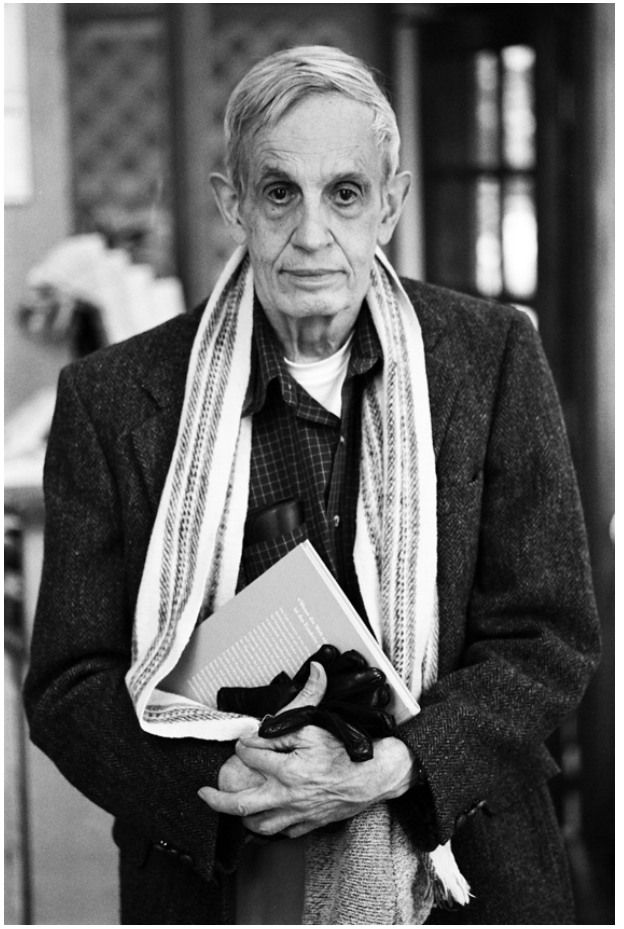
Nash and Hume

- Suppose $x + y = 1$ and $x, y > 0$
- Should the x-proposer switch?
  - If he increases, he gets 0
  - If he decreases, he gets $z < x$
- Should the y-proposer switch?
  - If she increases, she gets 0
  - If she decreases, she gets $z < y$

Nash and Hume

Every pair of demands such that $x + y = 1$ is stable.

- (½, ½)
- (0.99, 0.01)
- (¾, ¼)

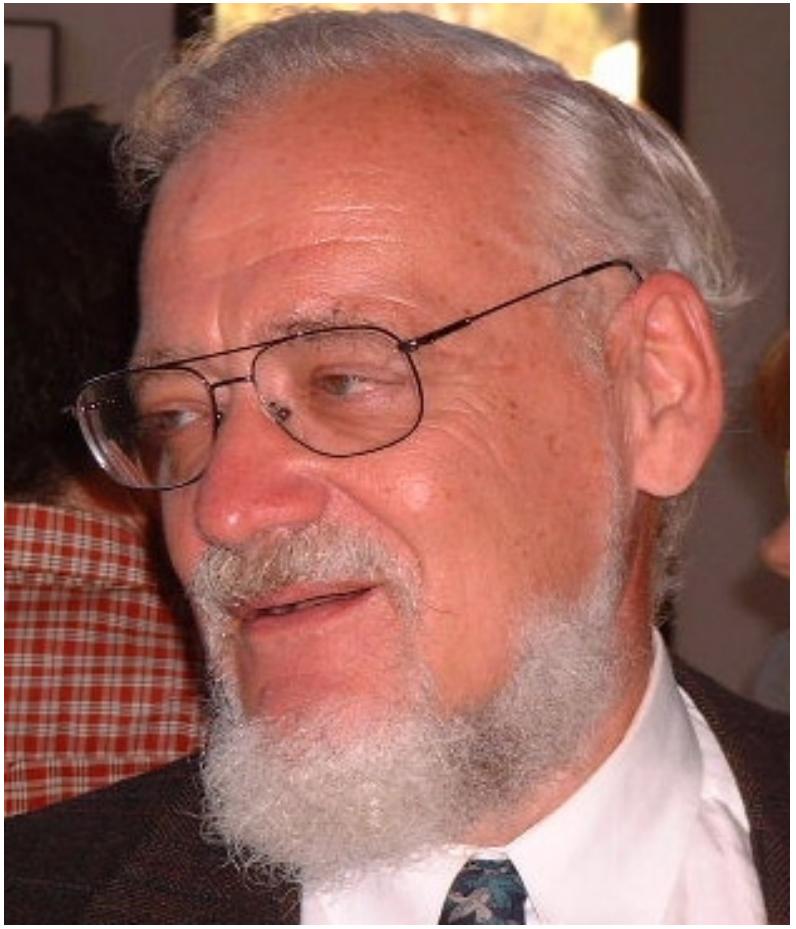


Two in a boat

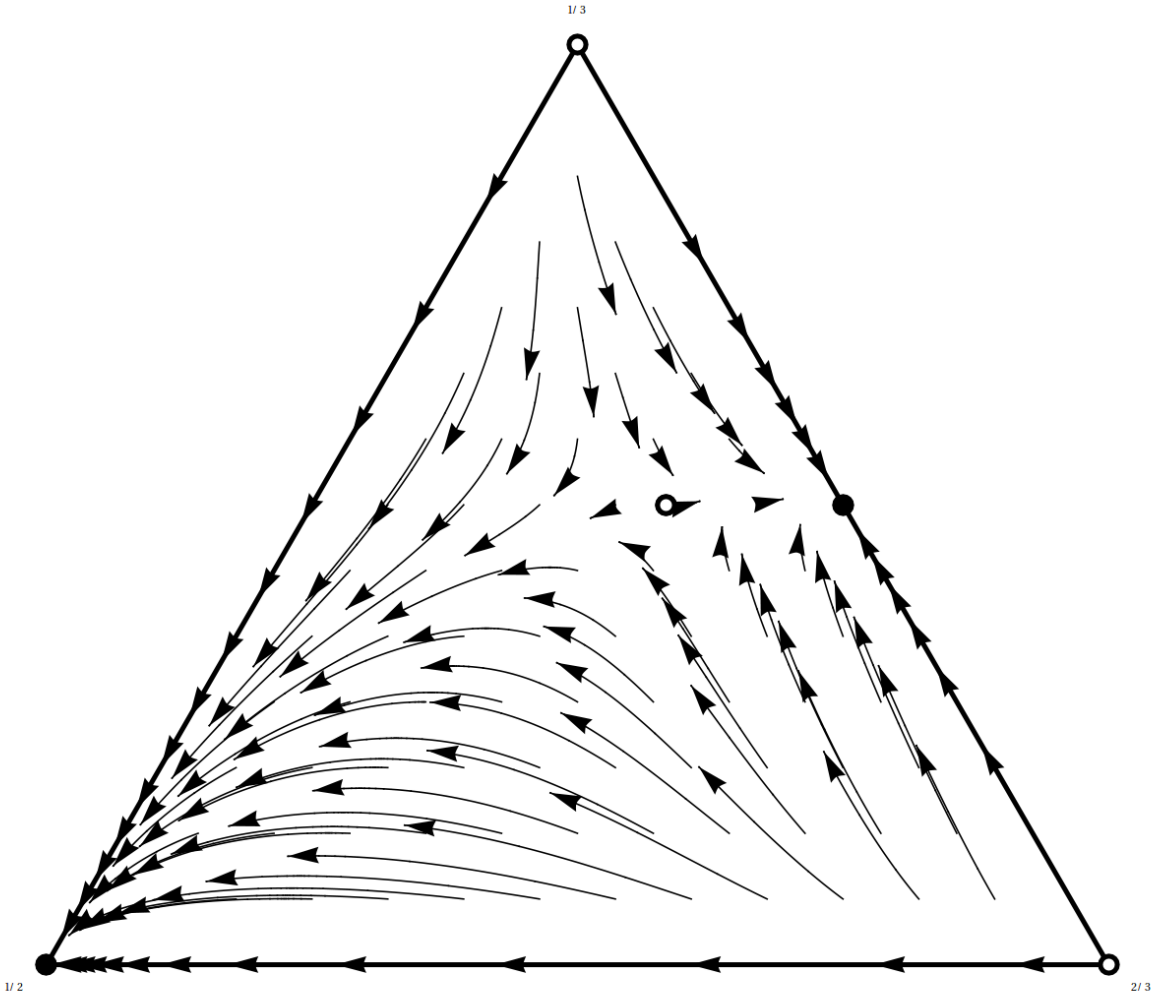
"Thus, two men pull the oars of a boat by common convention for common interest, without any promise or contract..."

Skyrms, Nash, and Hume

We should also model the process by which one or another norm is reached



Imitation



Half-answer

- Cultural evolution will lead to either stable outcome

- But it's more likely to lead to the outcome we regard as fair

Many modeling assumptions

- Infinite population
- No experimentation
- Random matching

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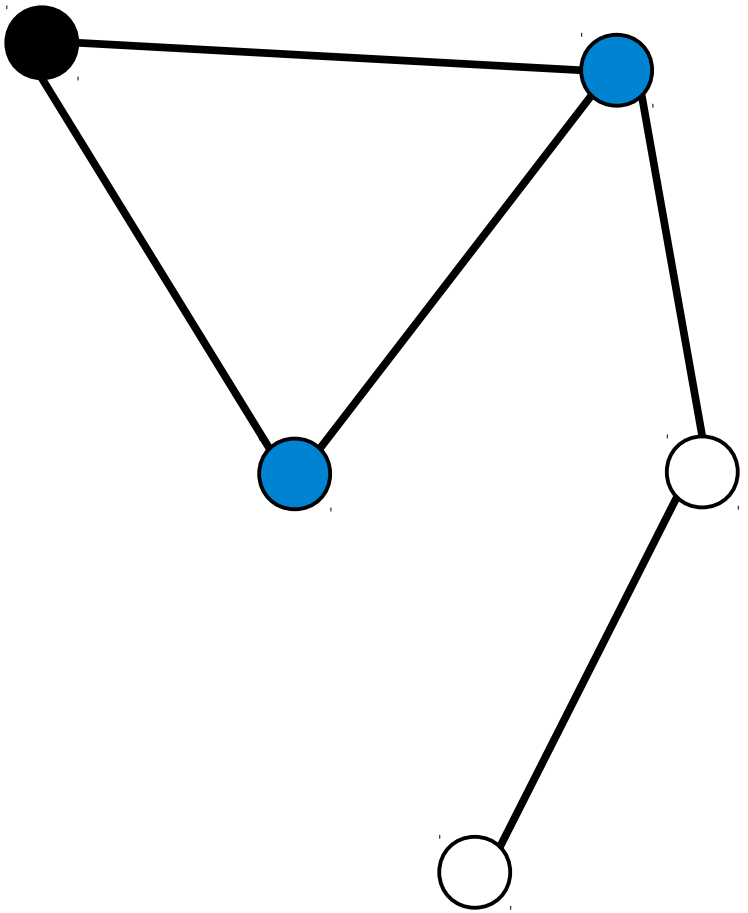
What if there is a social network?



Demand 1/3

Demand 1/2

Demand 2/3

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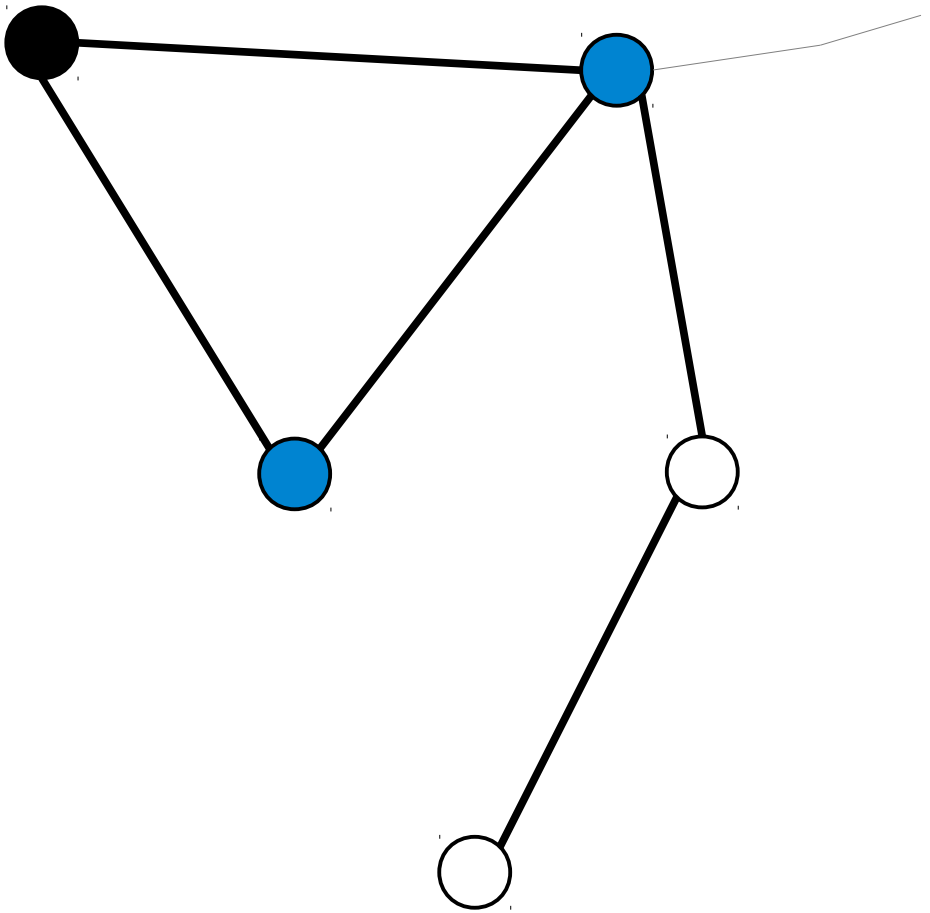

1 interaction: 0
2 interactions: 1/2

Average: 1/3

Demand 1/3

Demand 1/2

Demand 2/3

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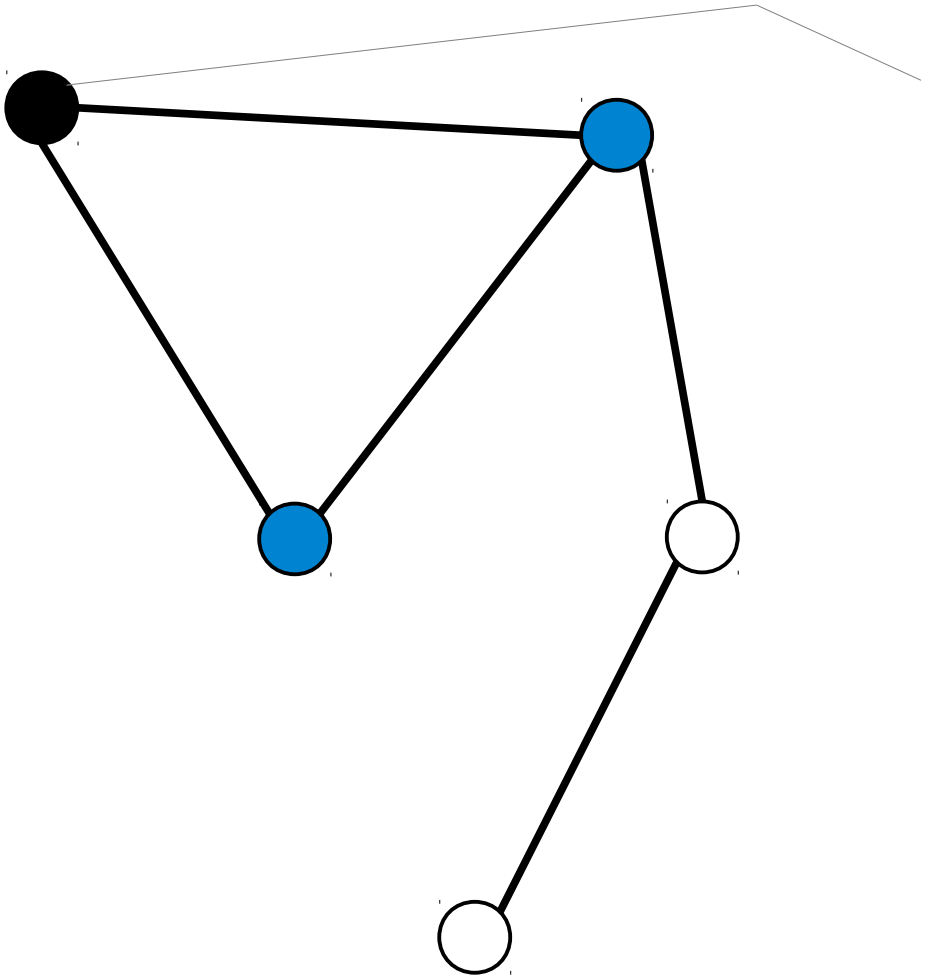

2 interaction: 0

Average: 0

Demand 1/3

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Demand 2/3

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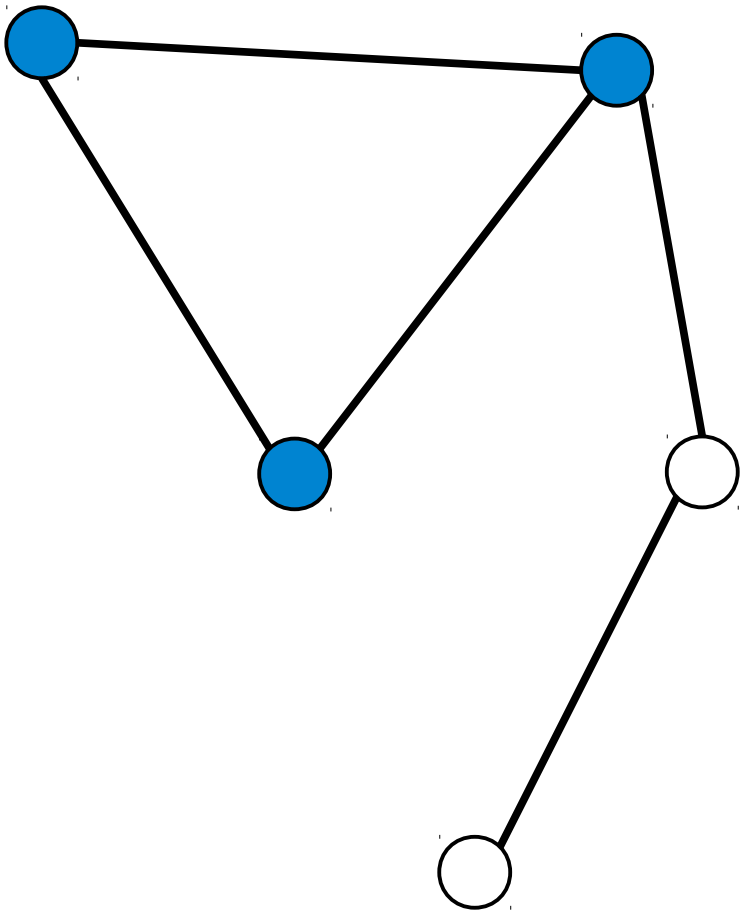

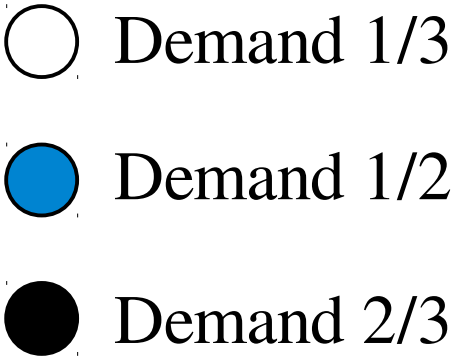

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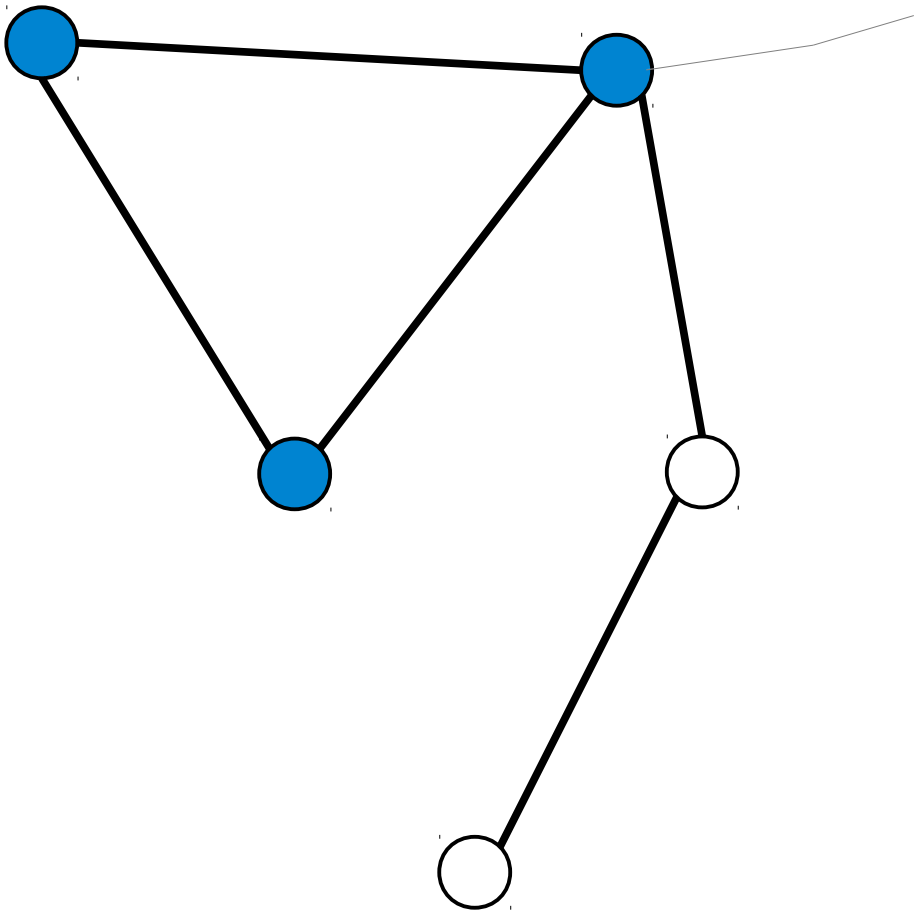

3 interactions: 1/2

Average: 1/2

Demand 1/3

Demand 1/2

Demand 2/3

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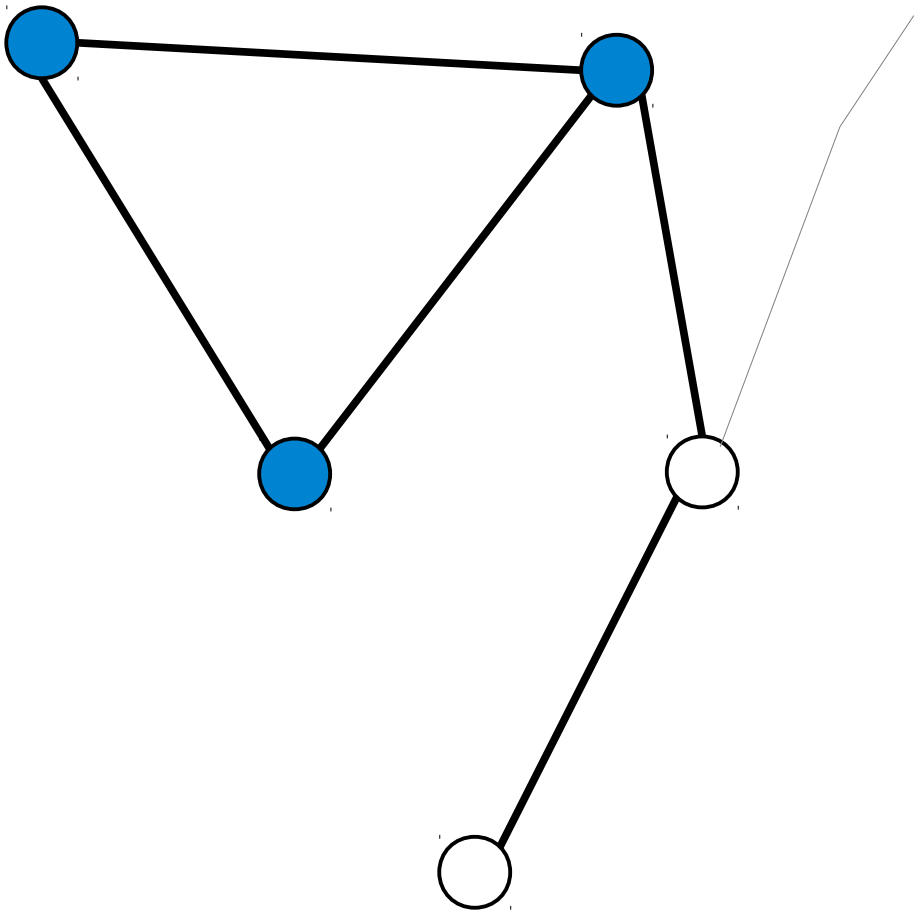

2 interactions: 1/3

Average: 1/3

Demand 1/3

Demand 1/2

Demand 2/3

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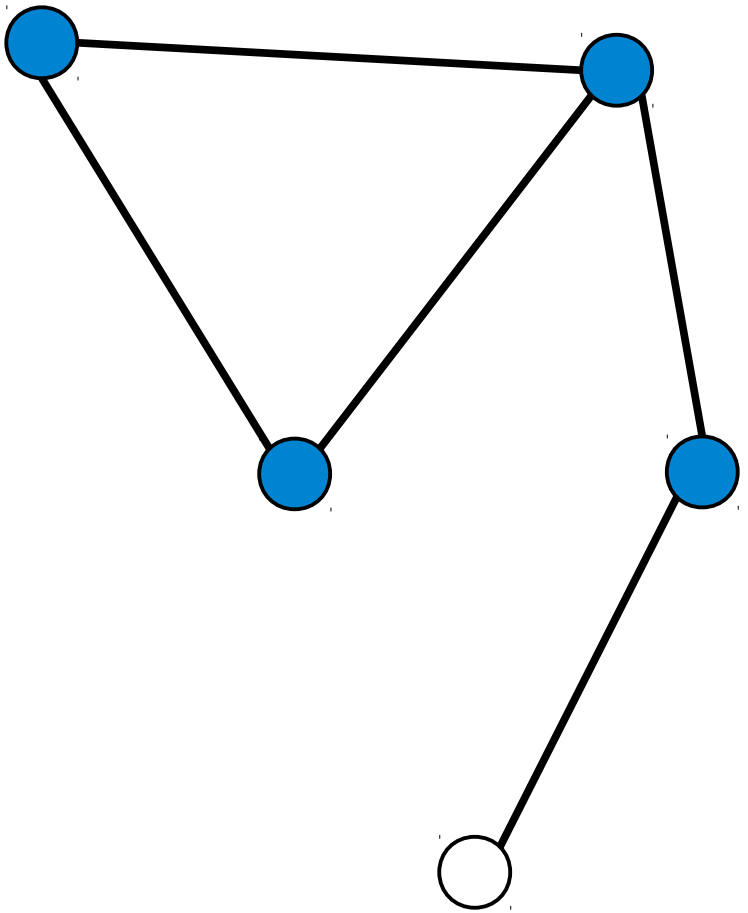

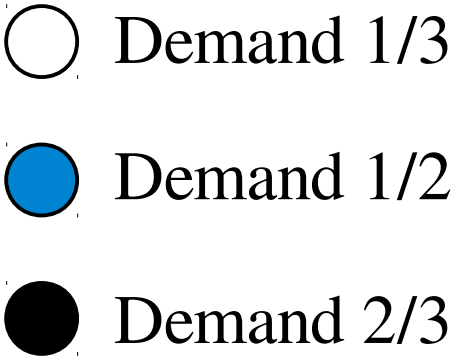

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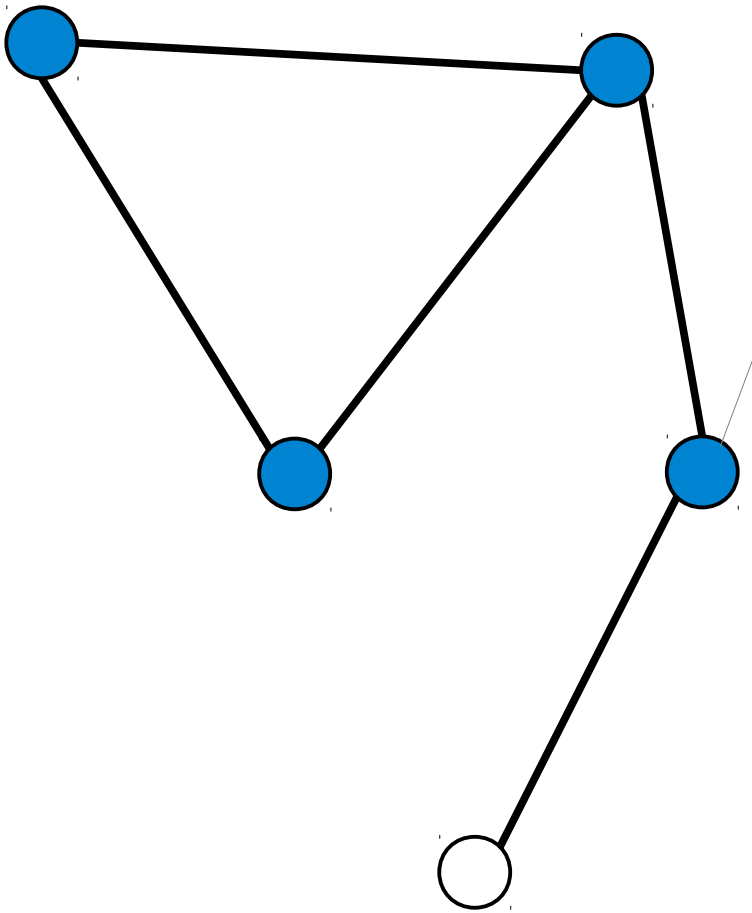

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Demand 2/3

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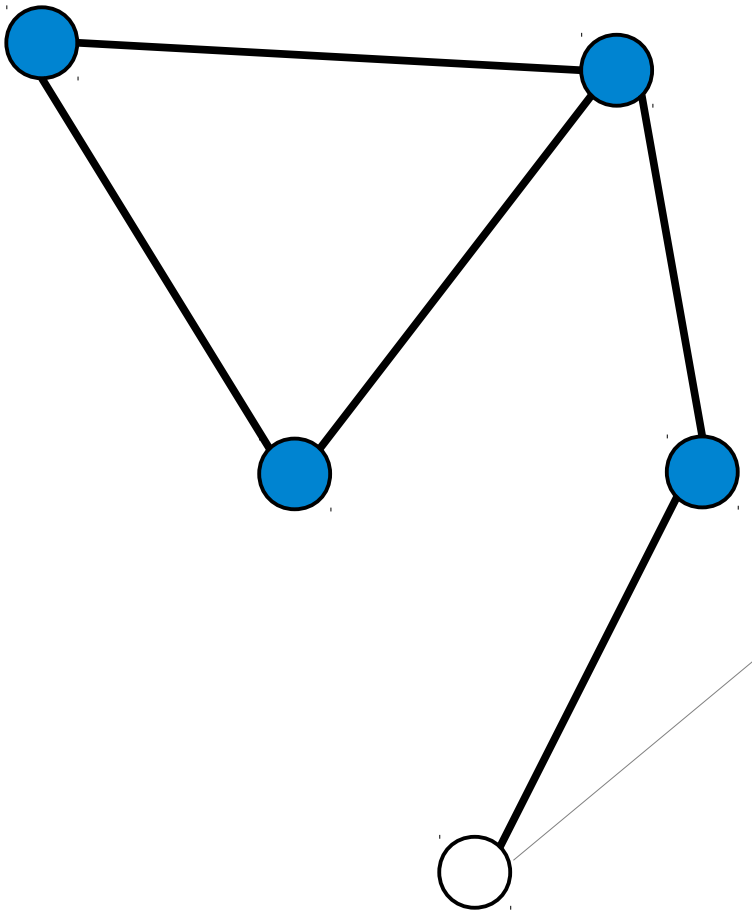

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Demand 2/3

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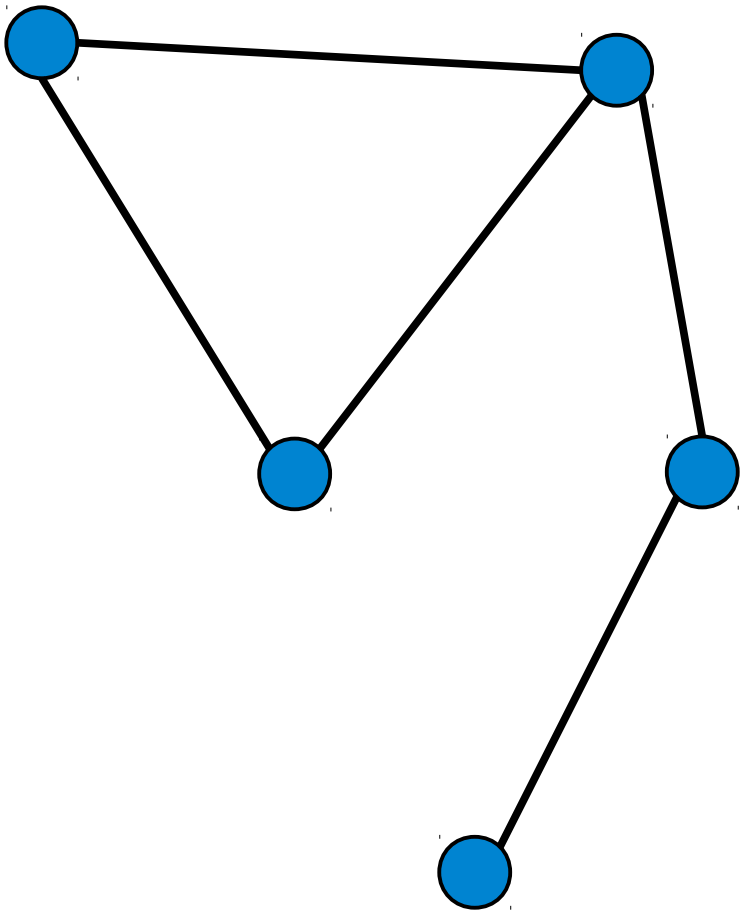


Demand 1/3

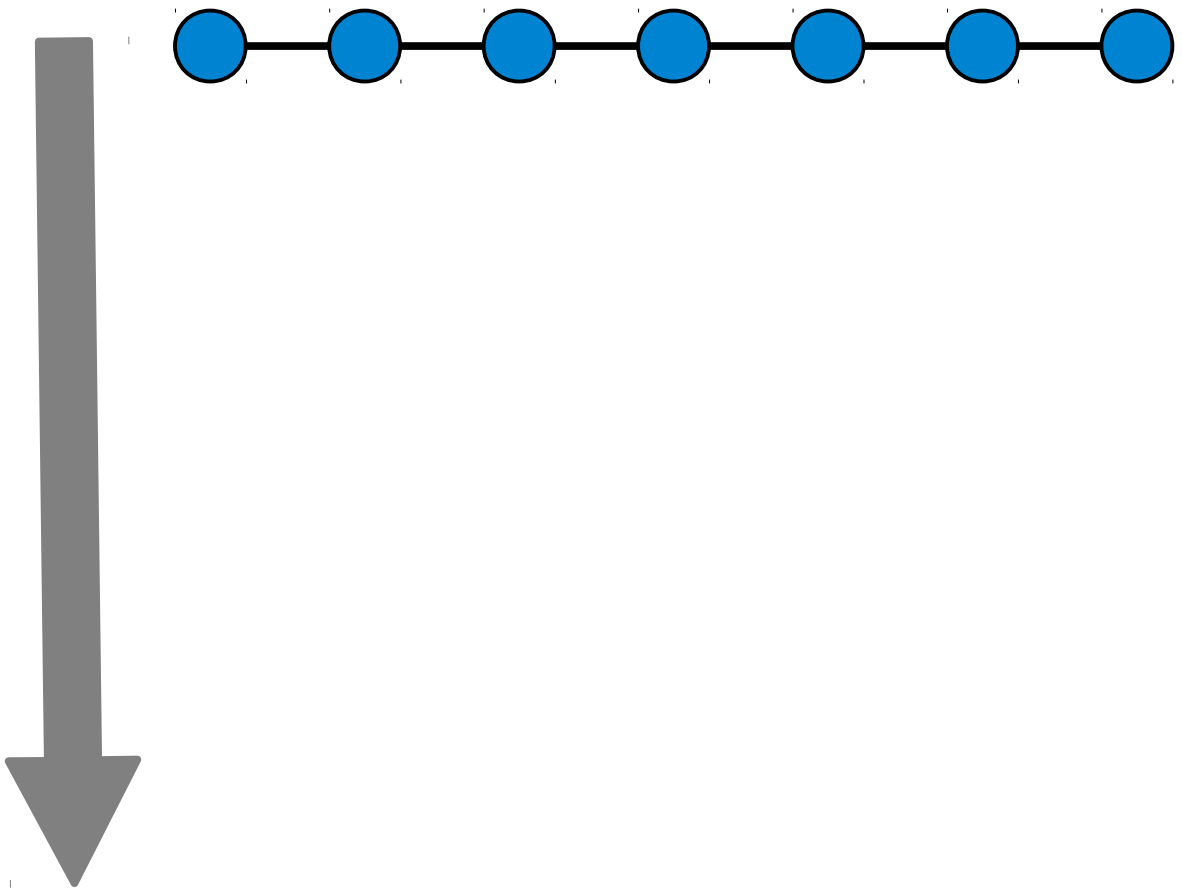
Demand 1/2

Demand 2/3

Alexander and Hume

- Began by analyzing two special networks
  - Line
  - Grid

Justice on the line



Demand 1/3

Demand 1/2

Demand 2/3

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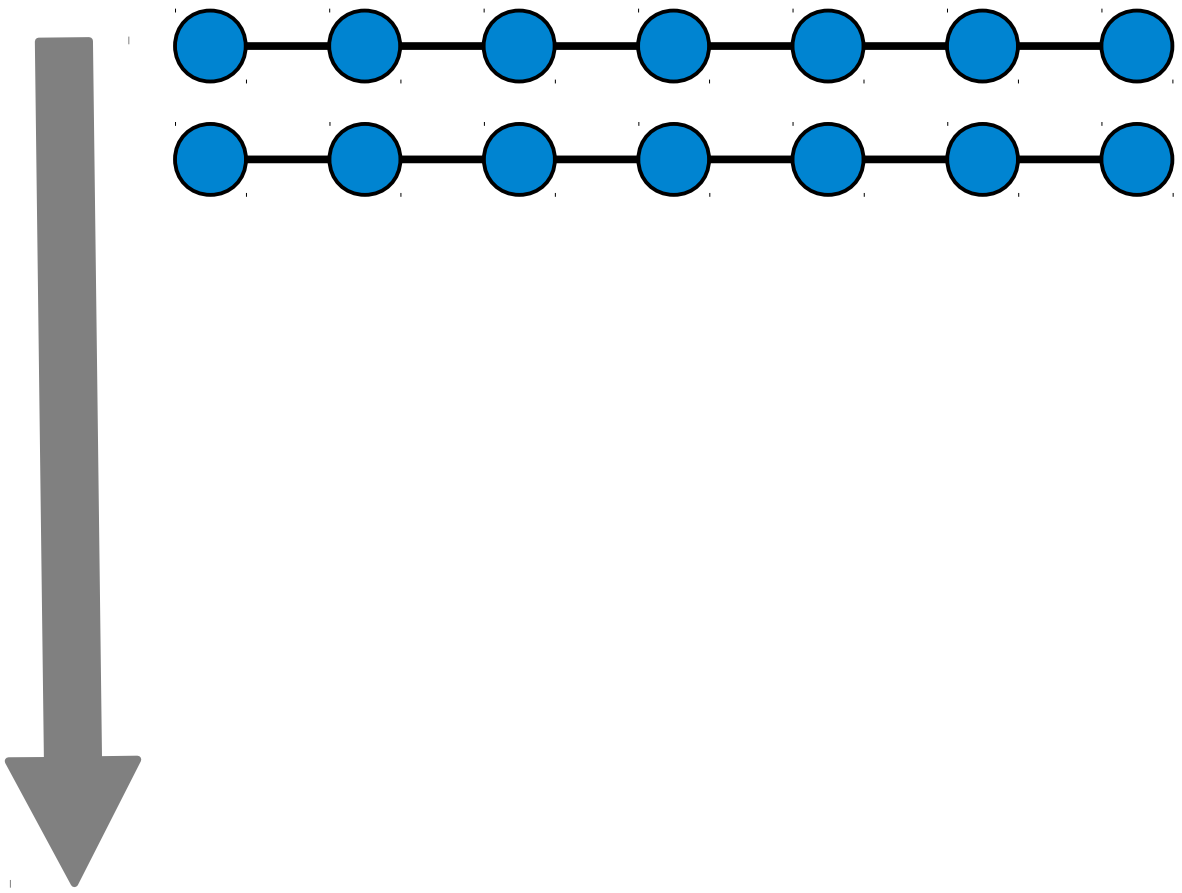

Demand 1/3

Demand 1/2

Demand 2/3

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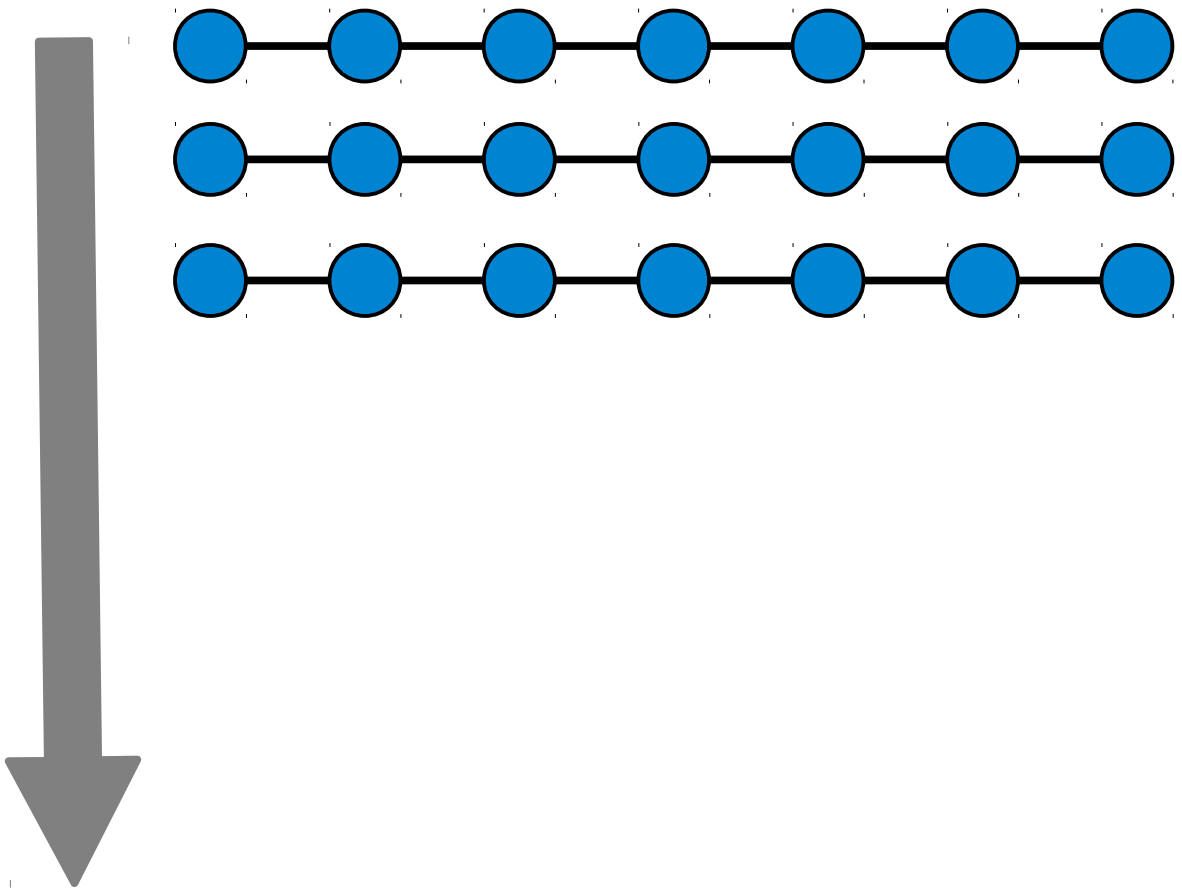

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Demand 1/2

Demand 2/3

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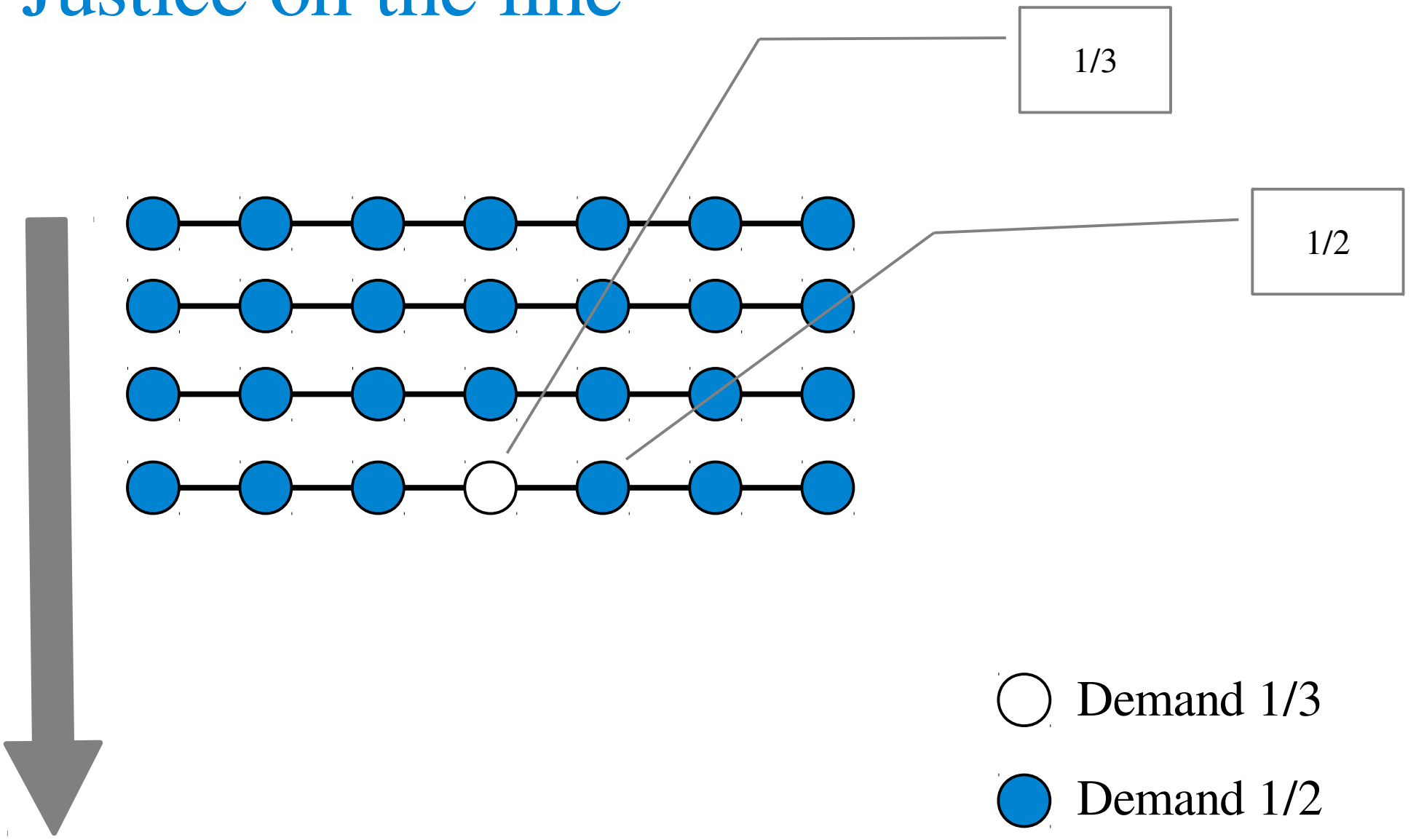

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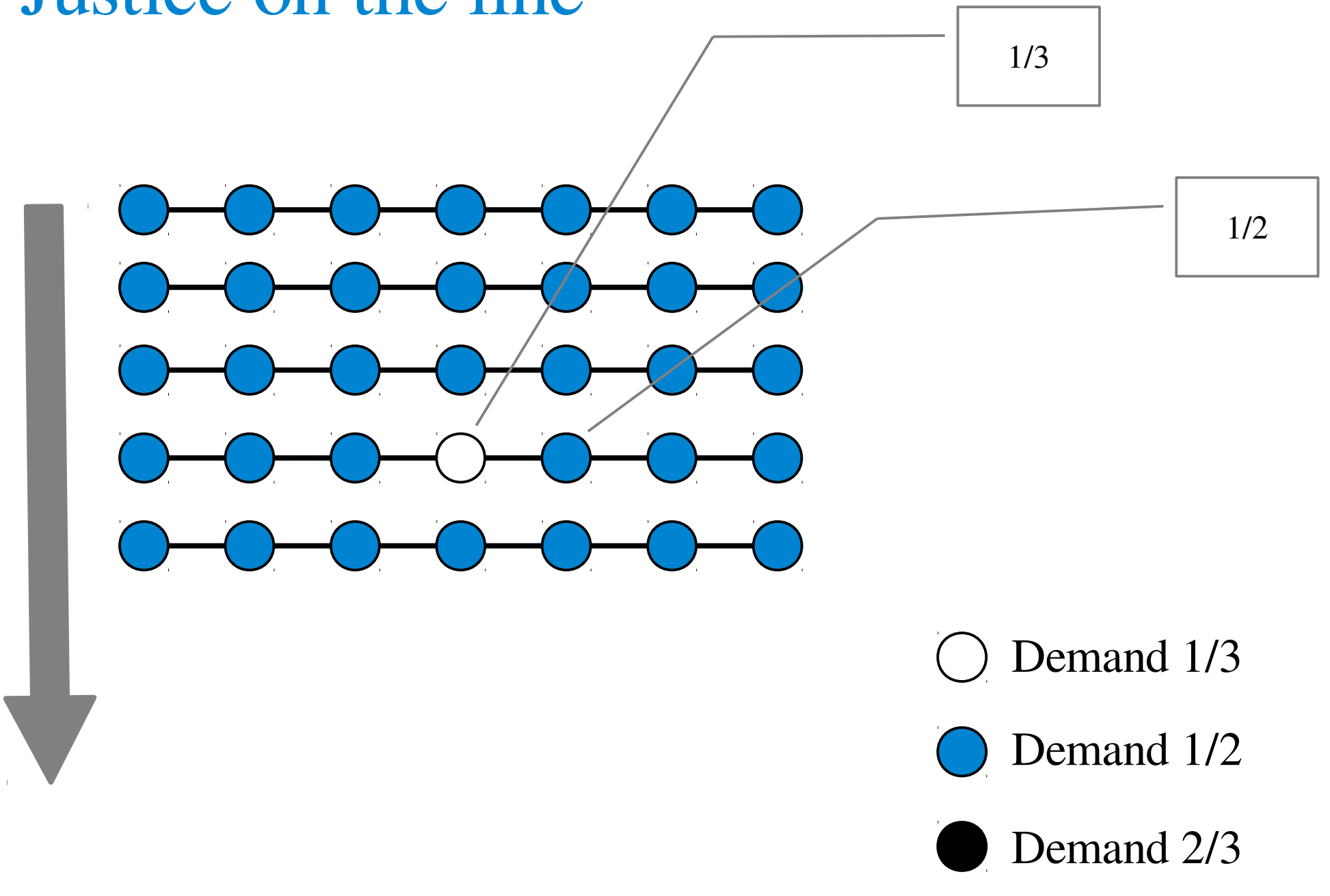

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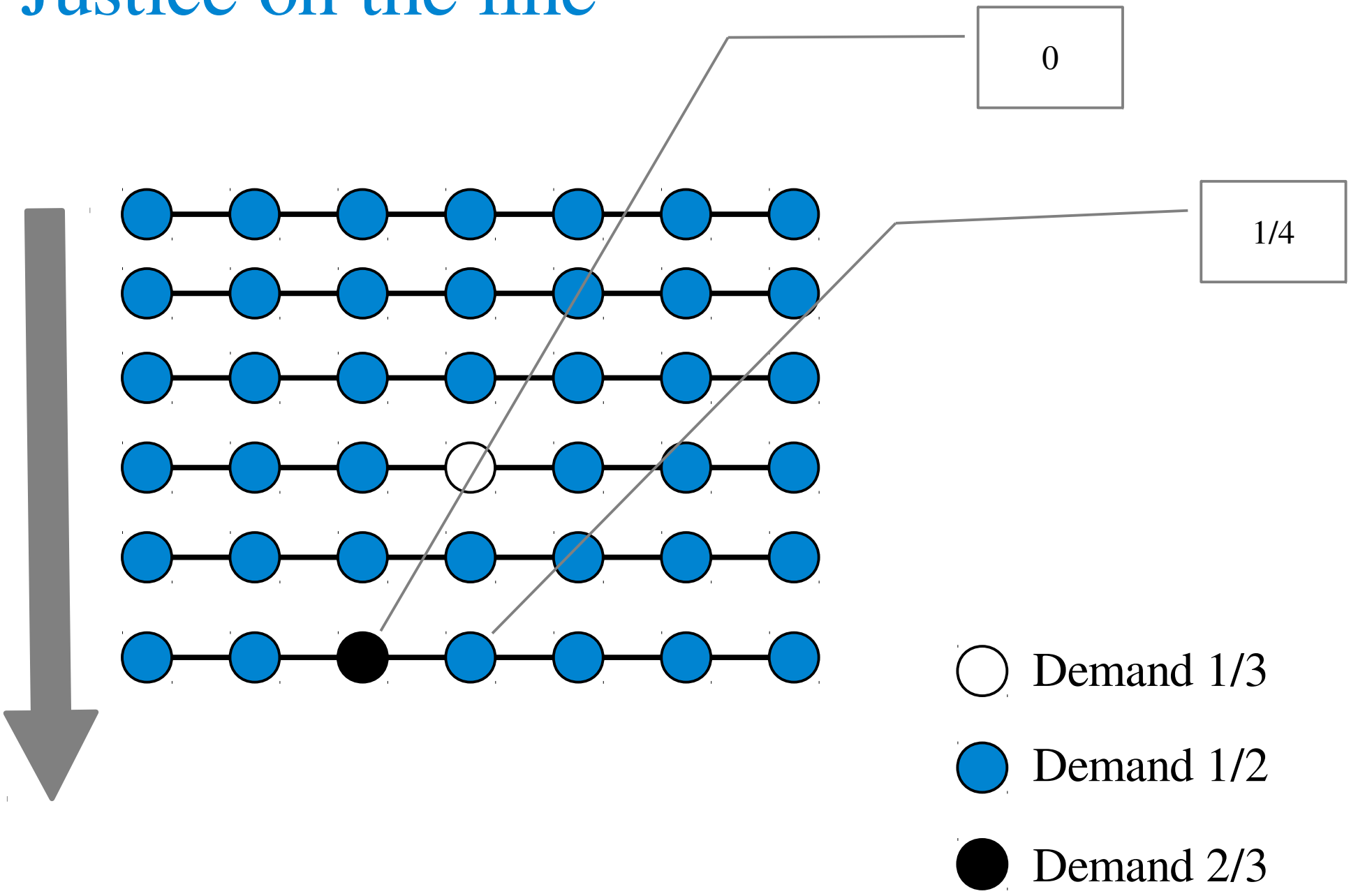

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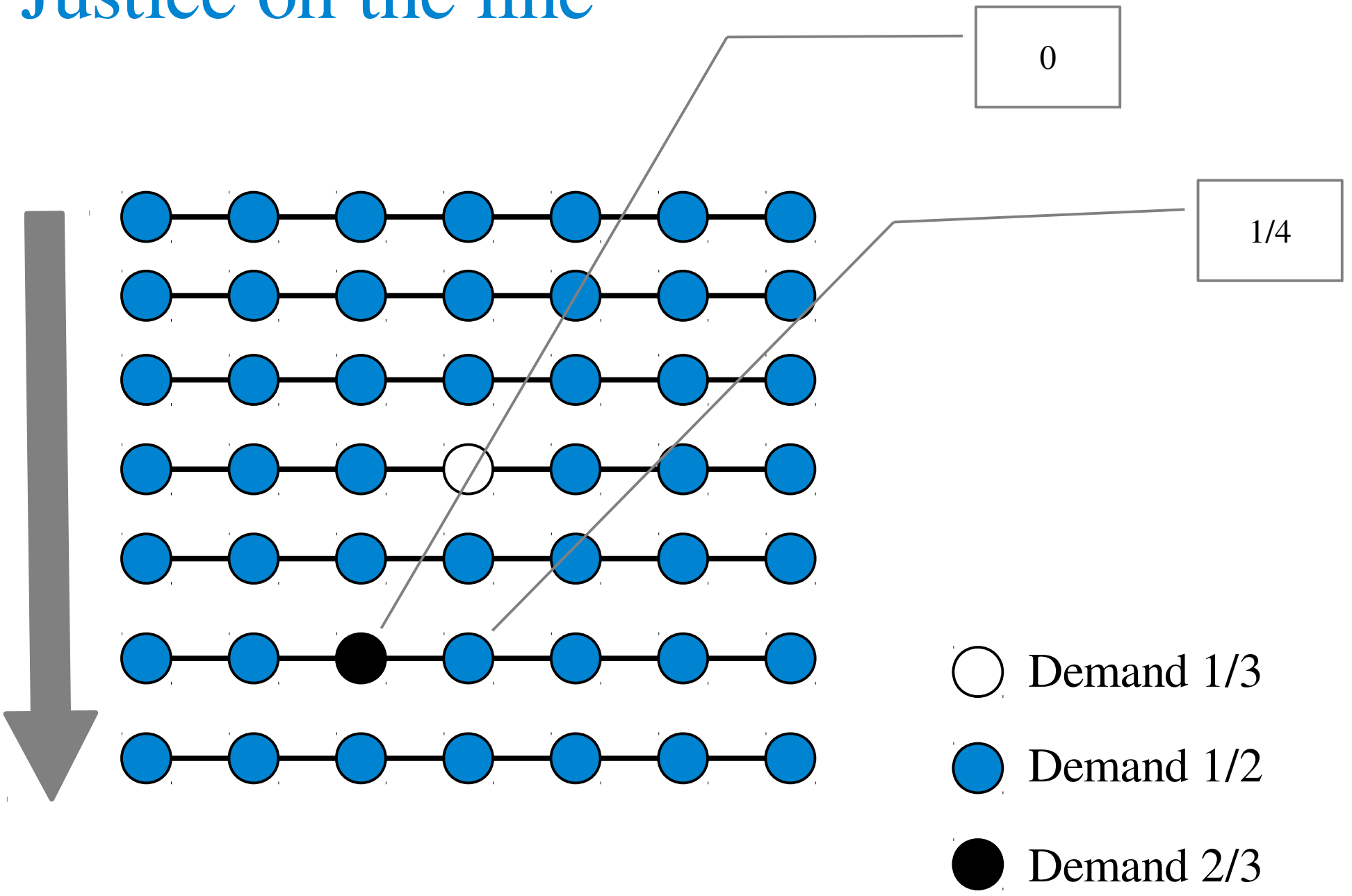

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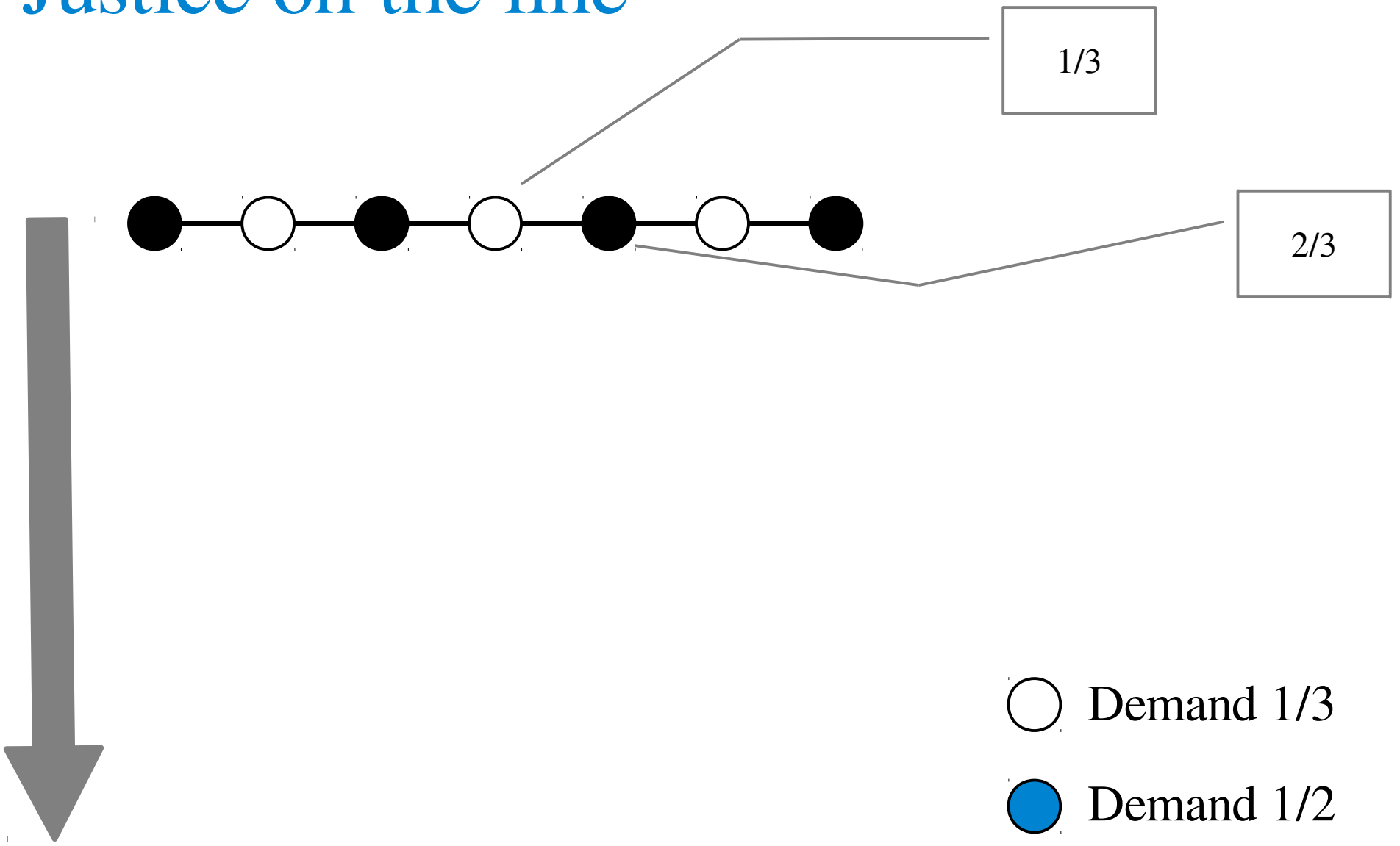

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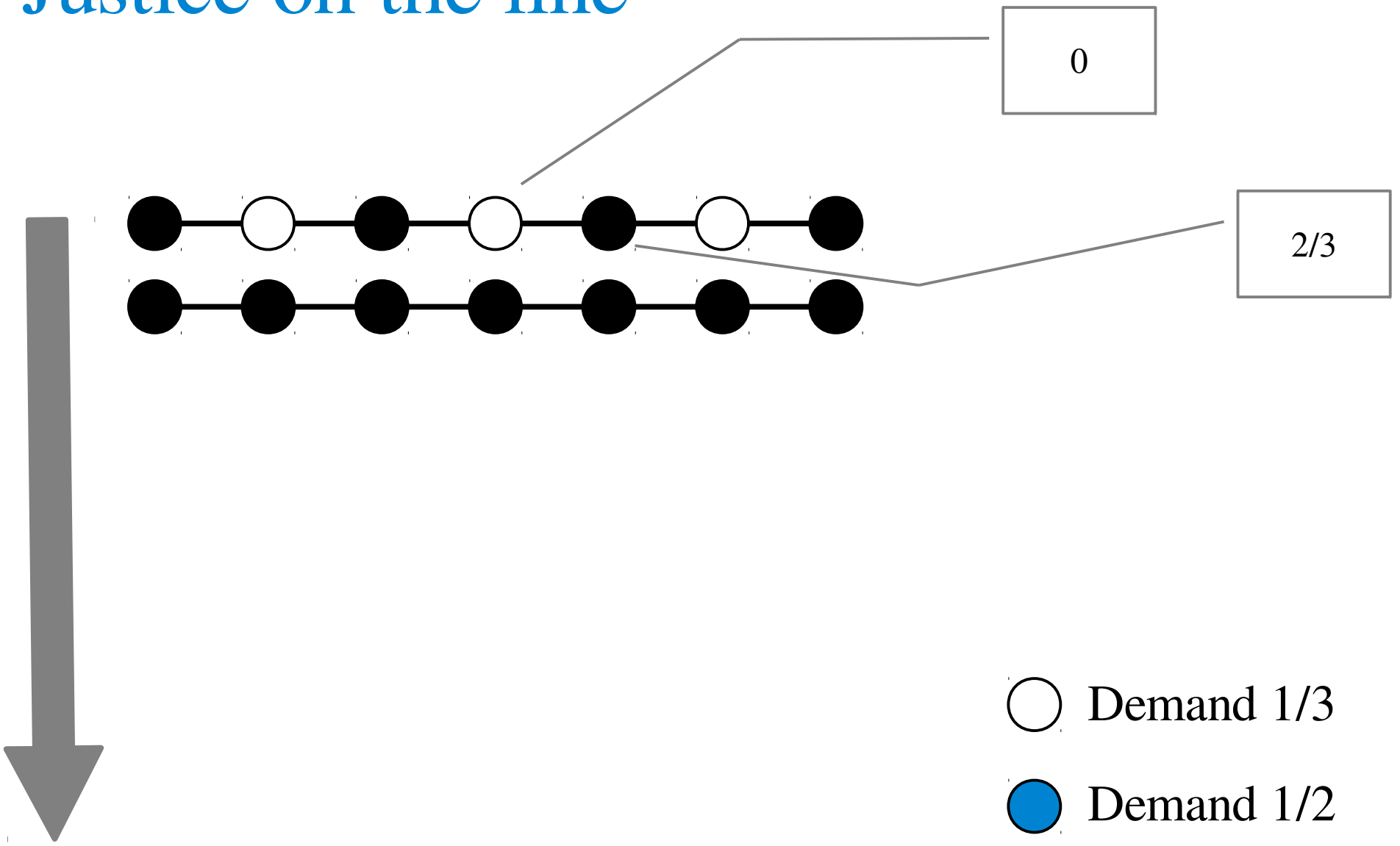

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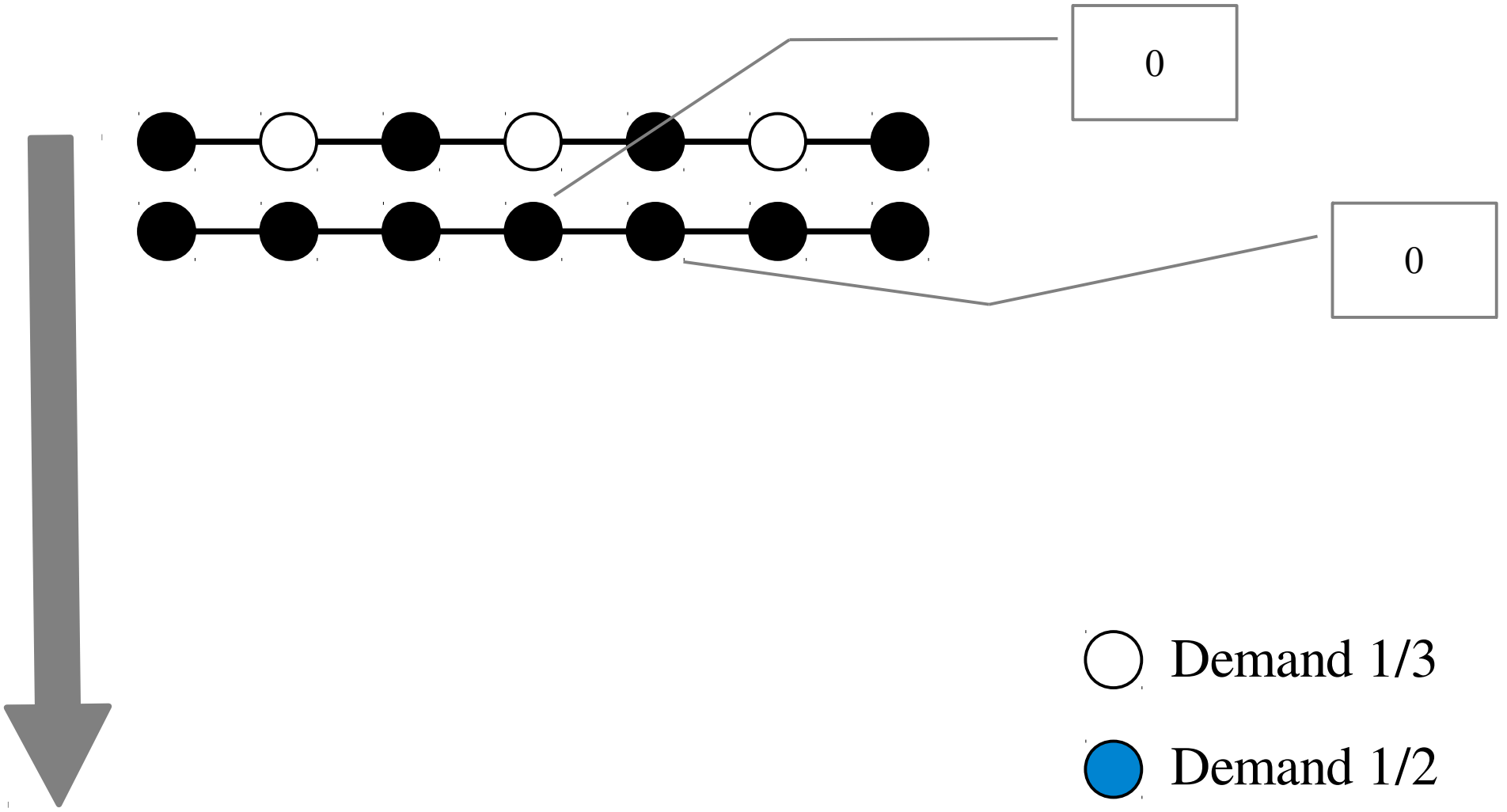

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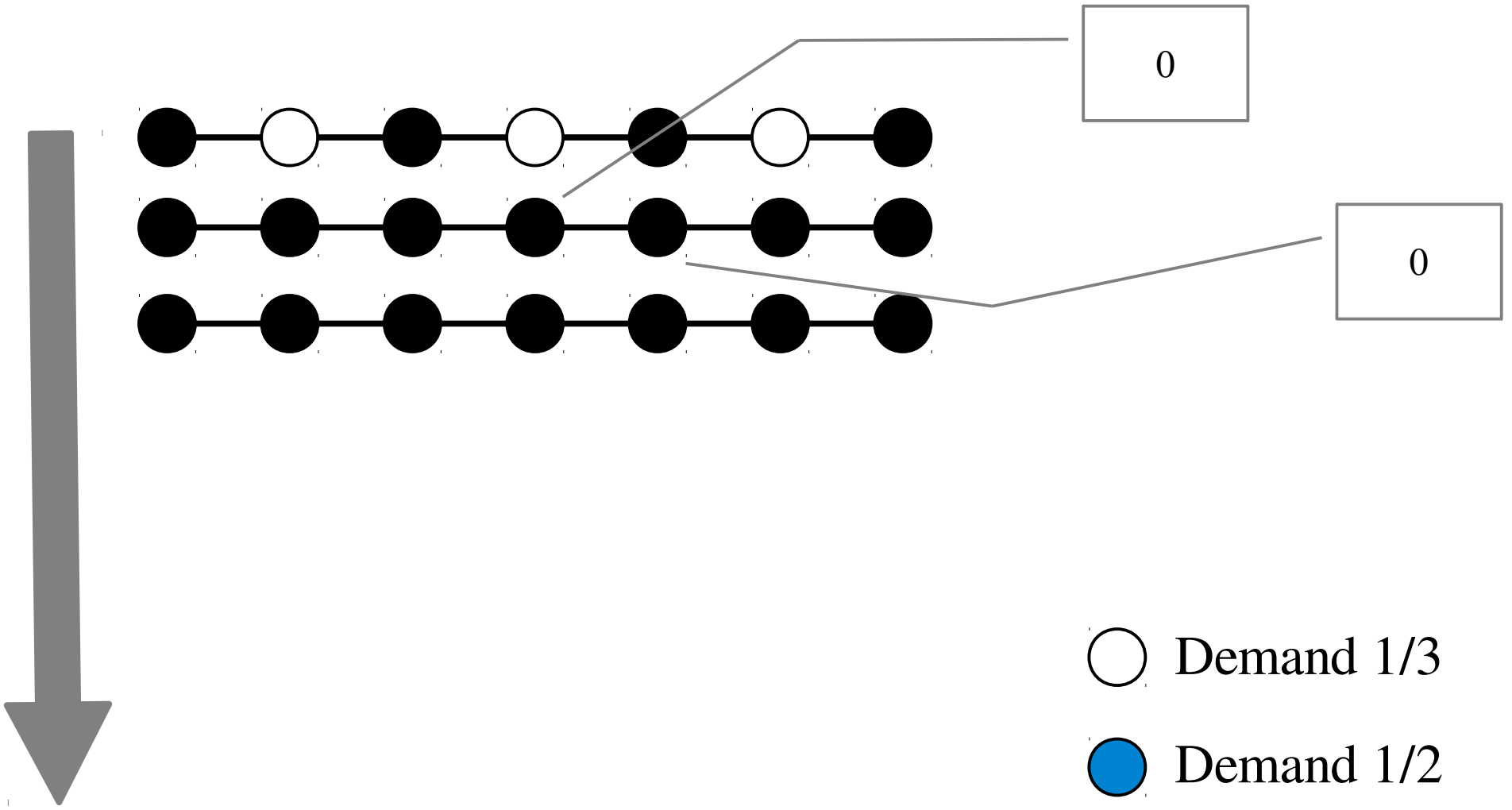

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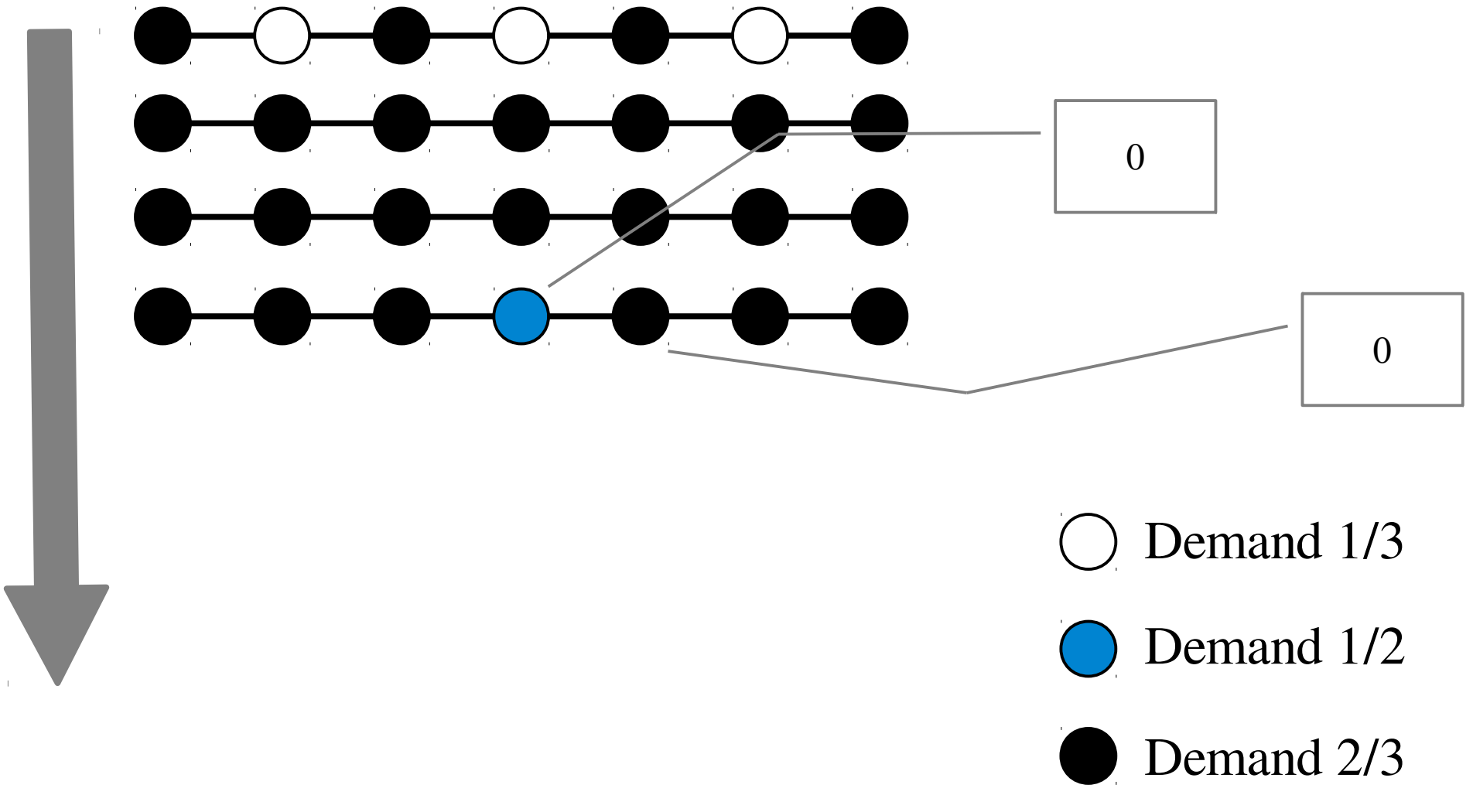

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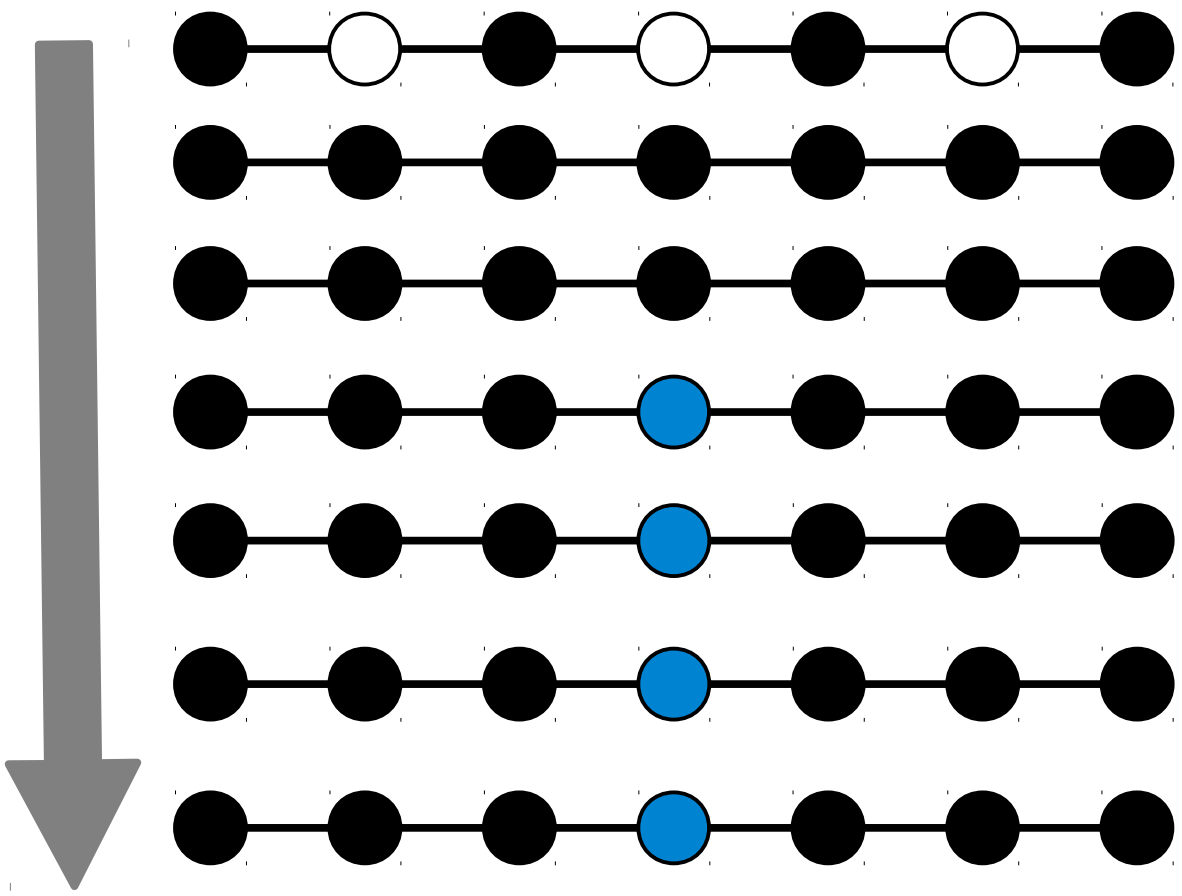
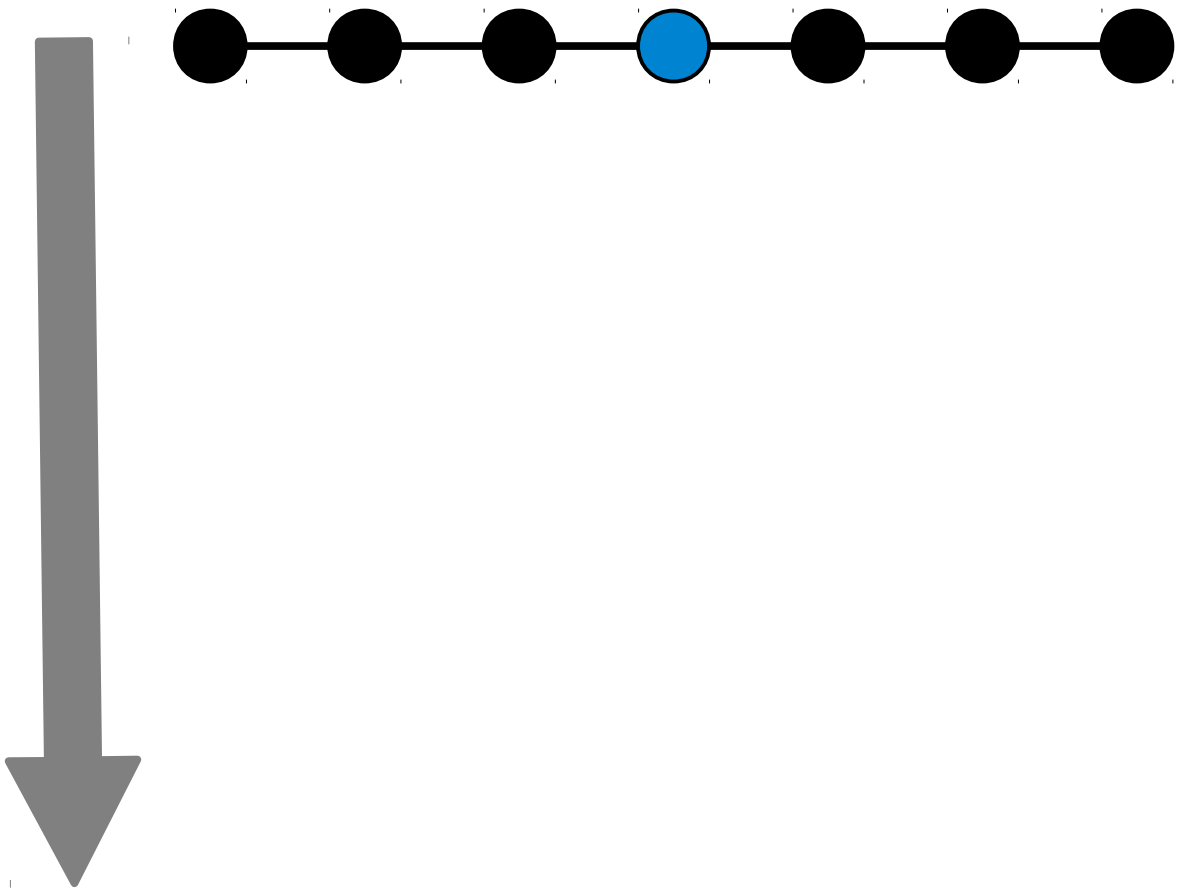


Demand 1/3

Demand 1/2

Demand 2/3

Justice on the line



Demand 1/3

Demand 1/2

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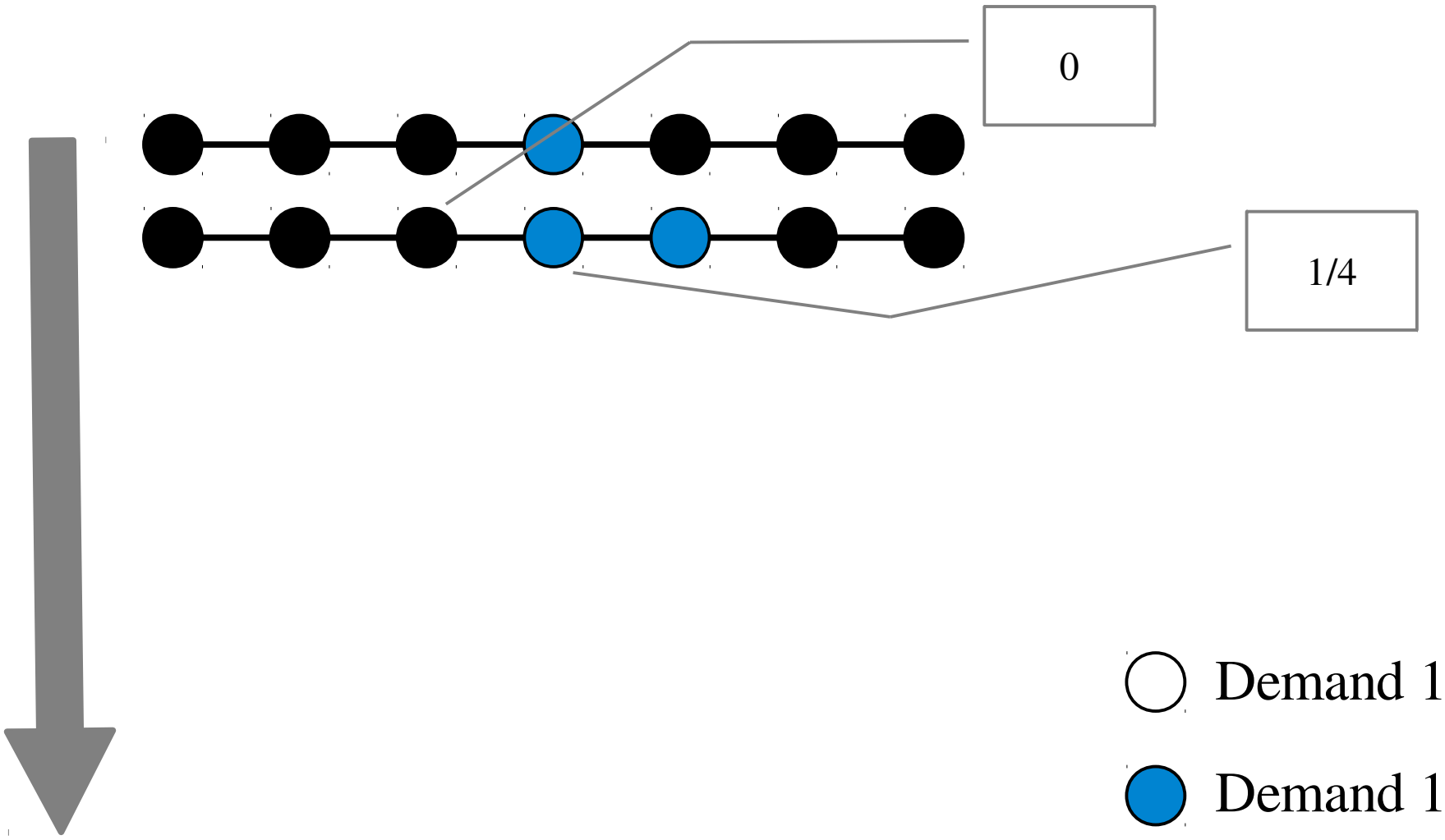

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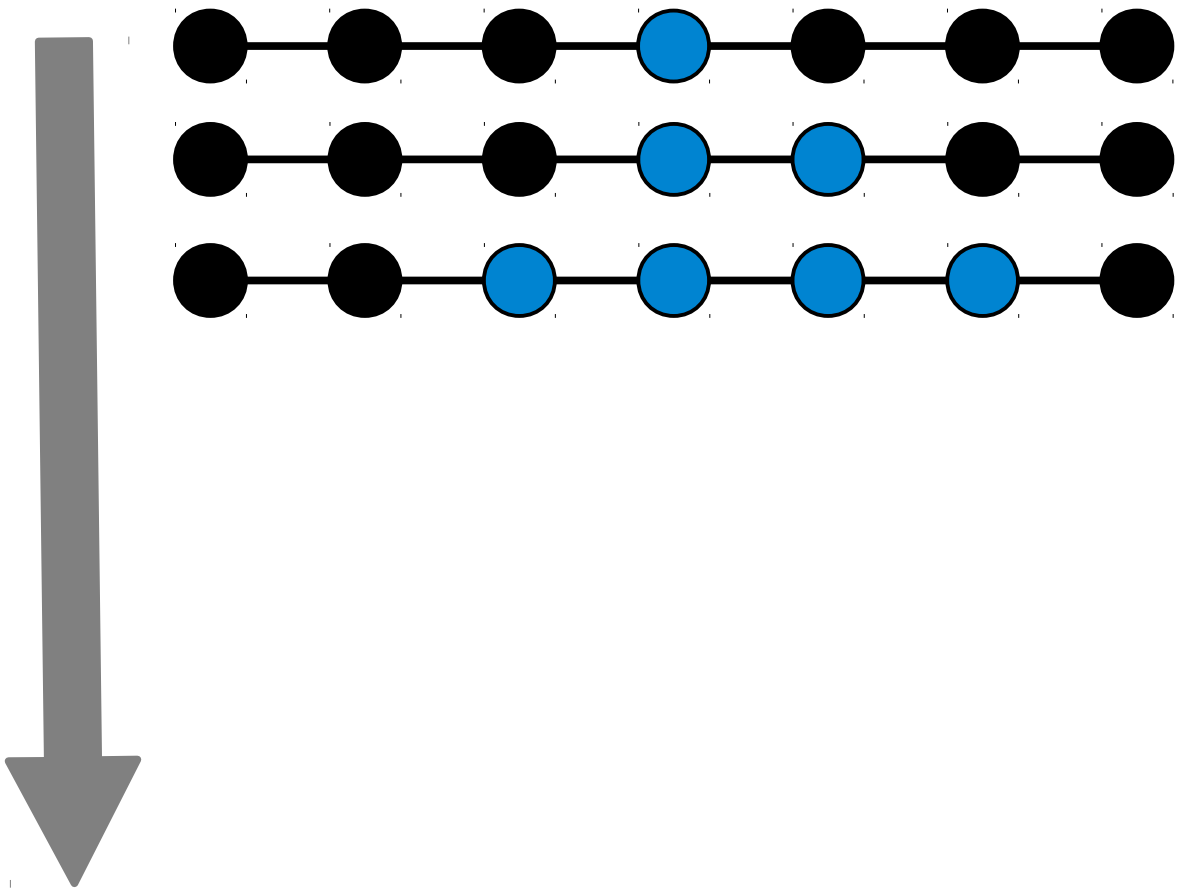

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Demand 1/2

Demand 2/3

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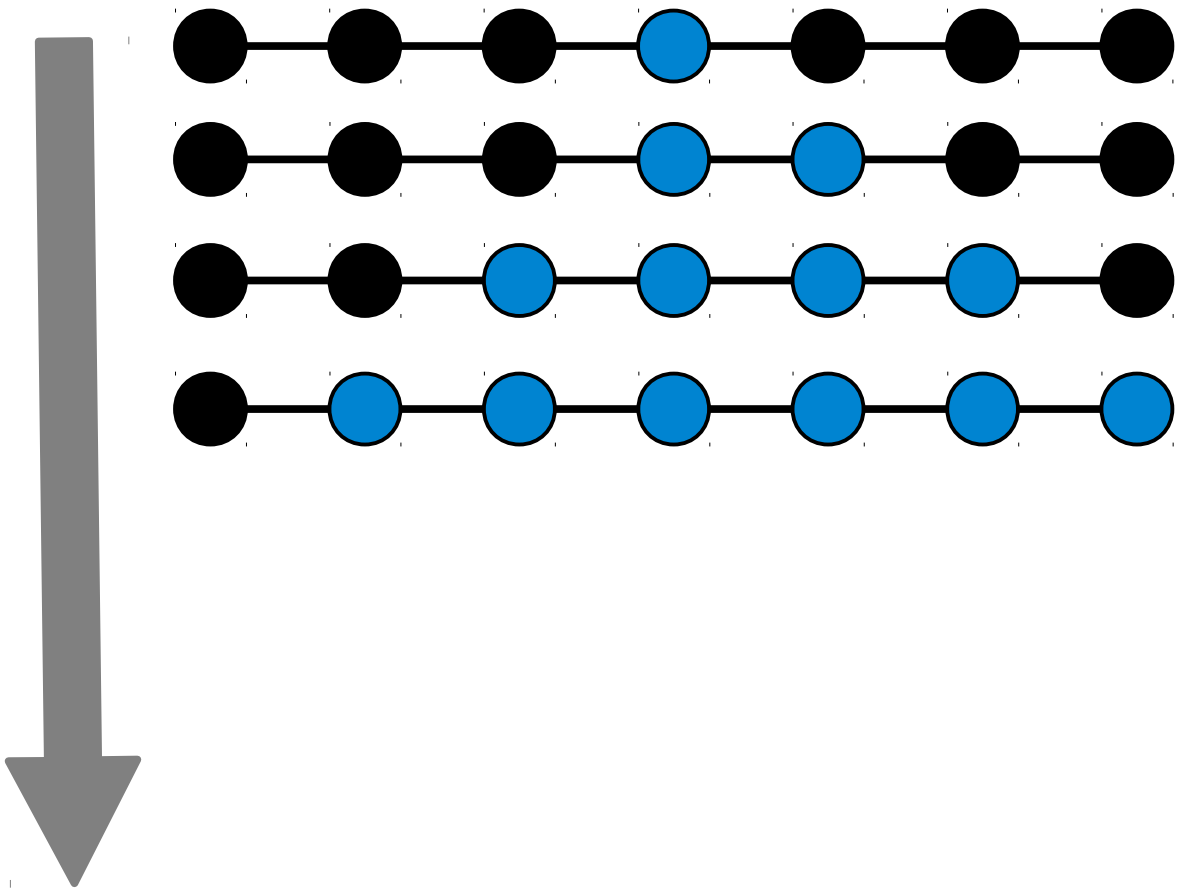

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Demand 1/2

Demand 2/3

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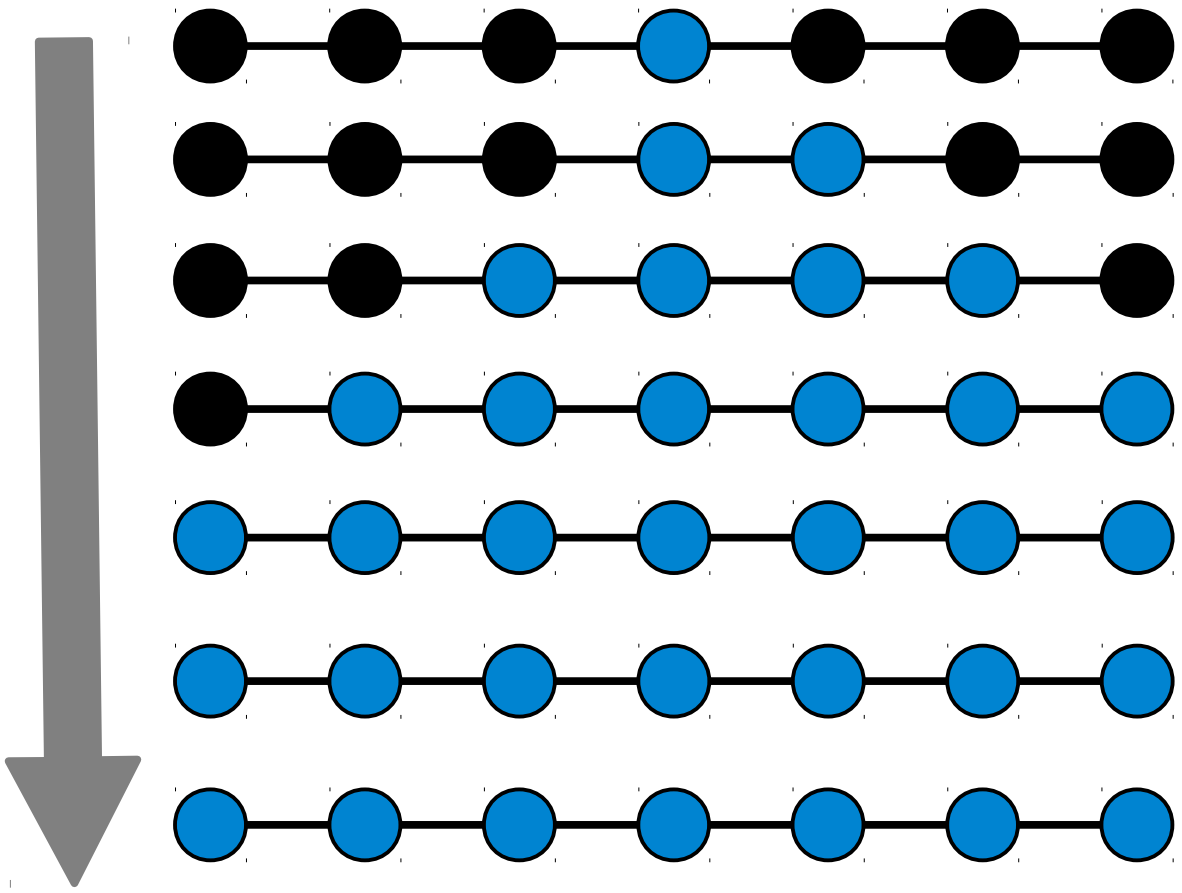


Demand 1/3

Demand 1/2

Demand 2/3

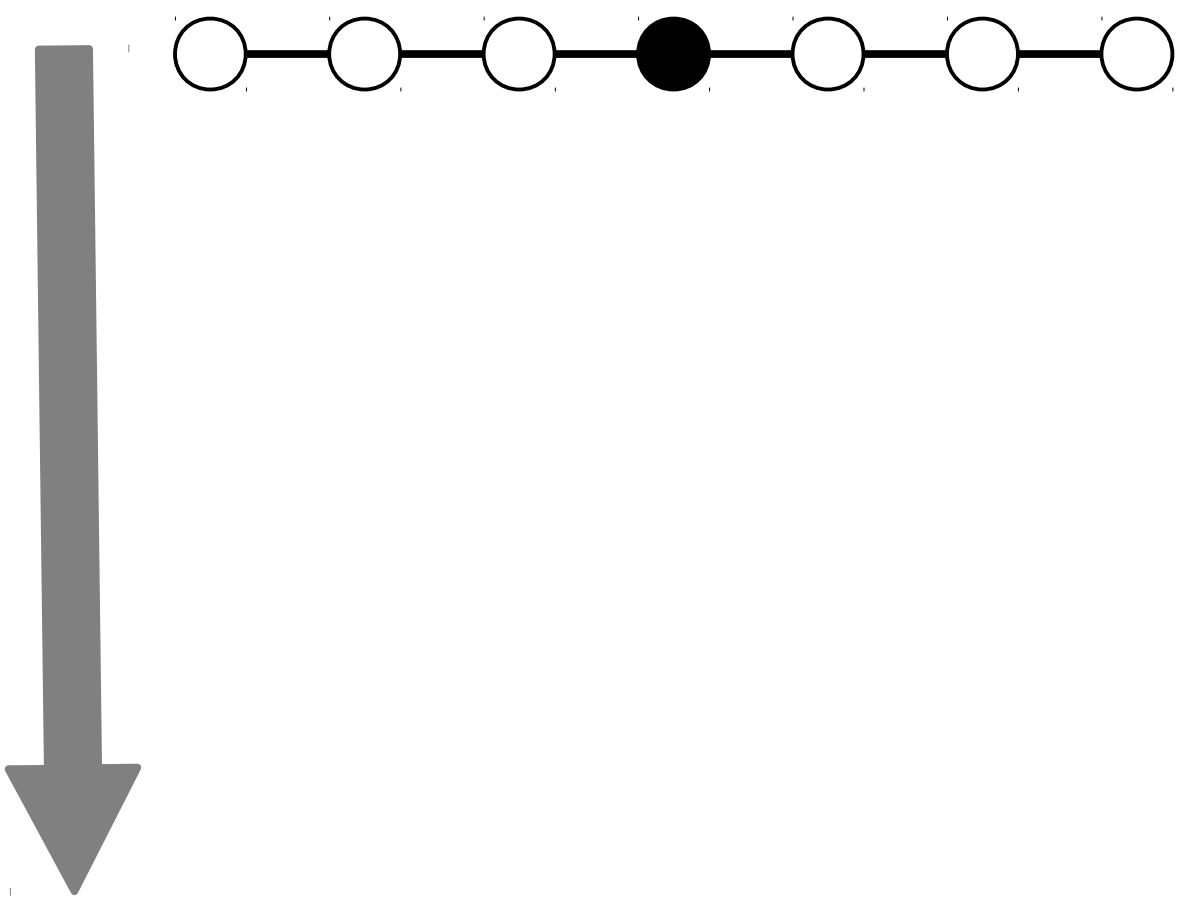
Comparison

Network structure helps to encourage the emergence of fairness norms

Oddities

Network structure does introduce a few oddities

Justice on the line

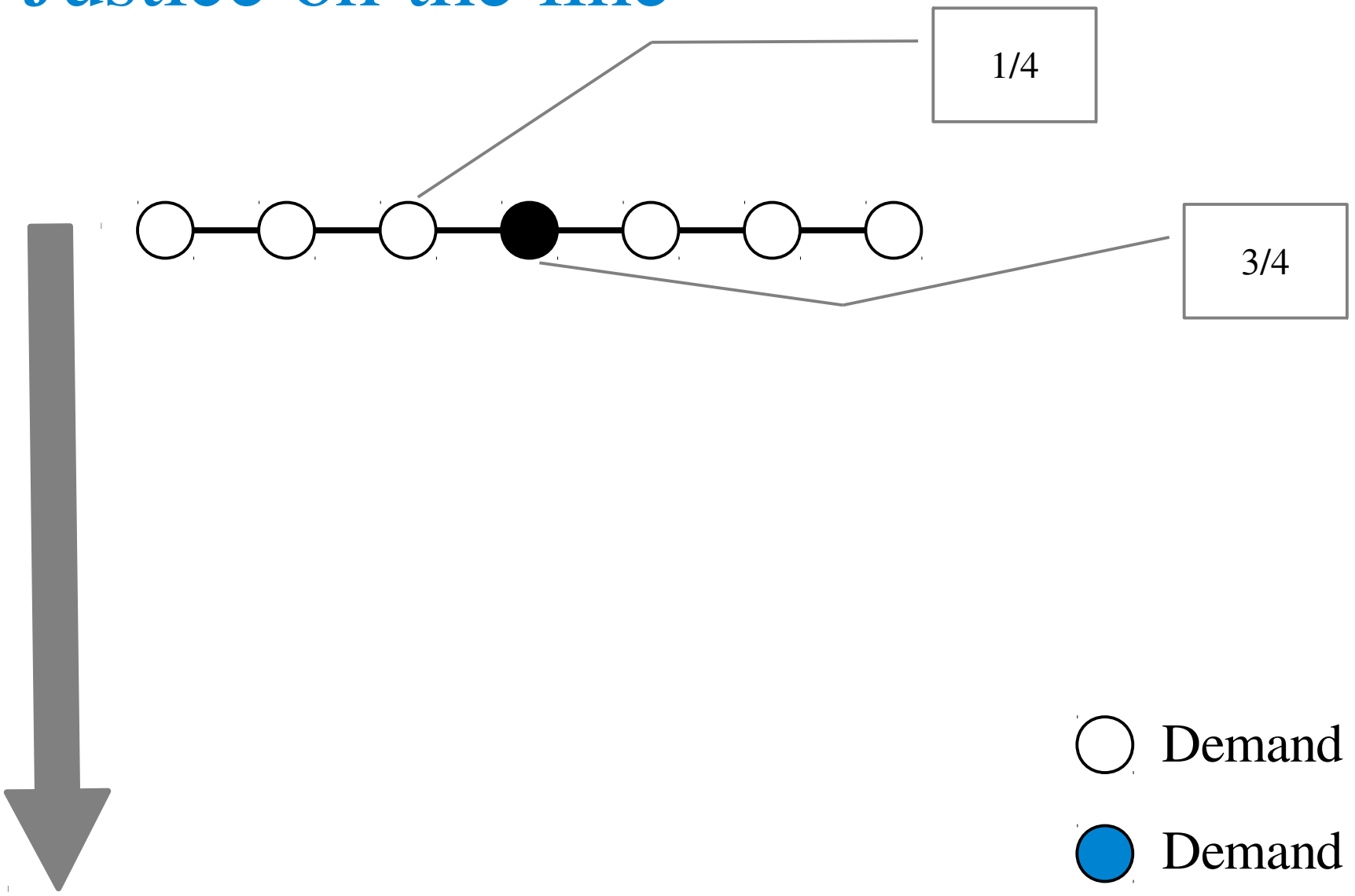


Demand 1/4

Demand 1/2

Demand 3/4

Justice on the line



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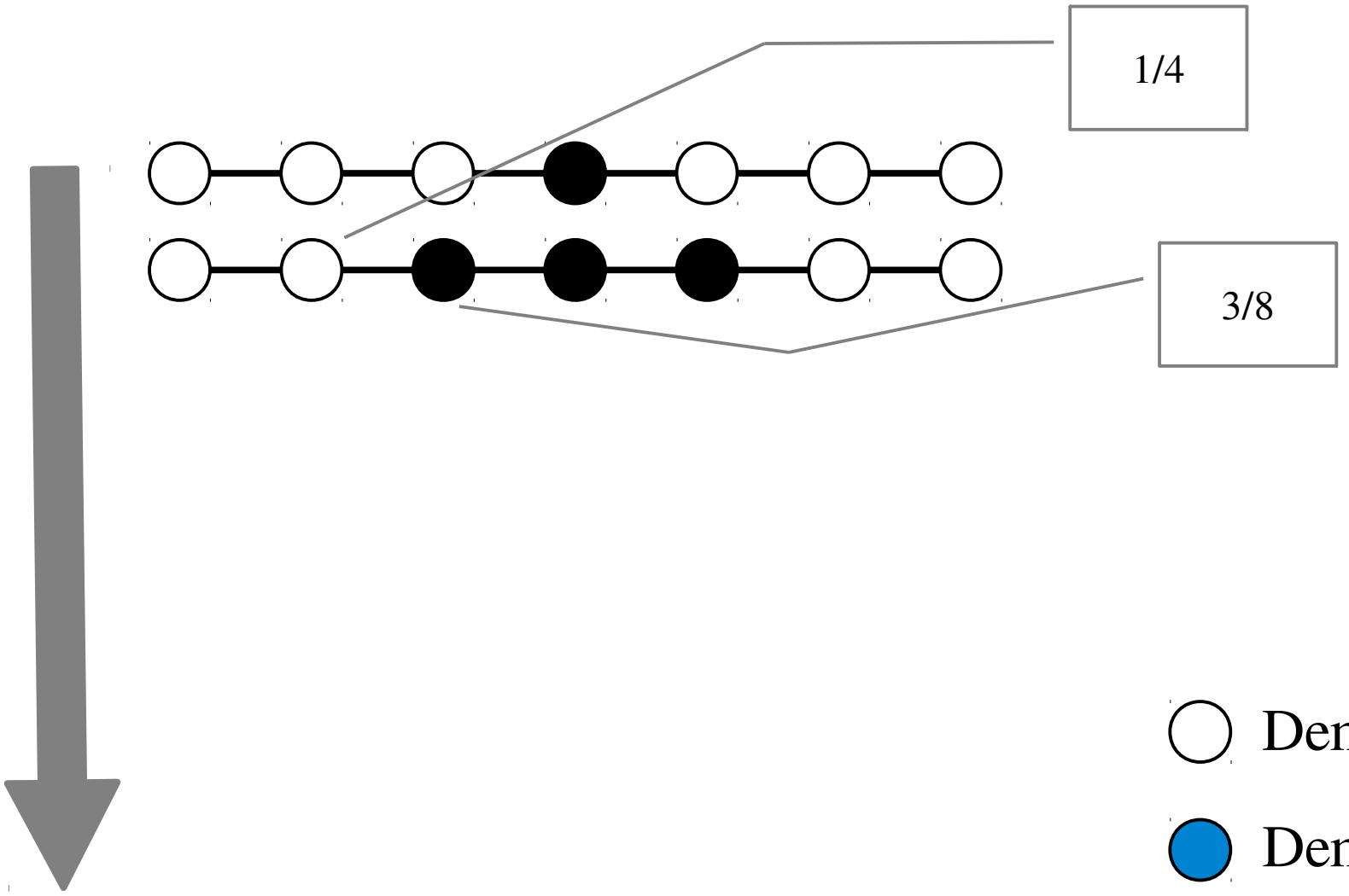

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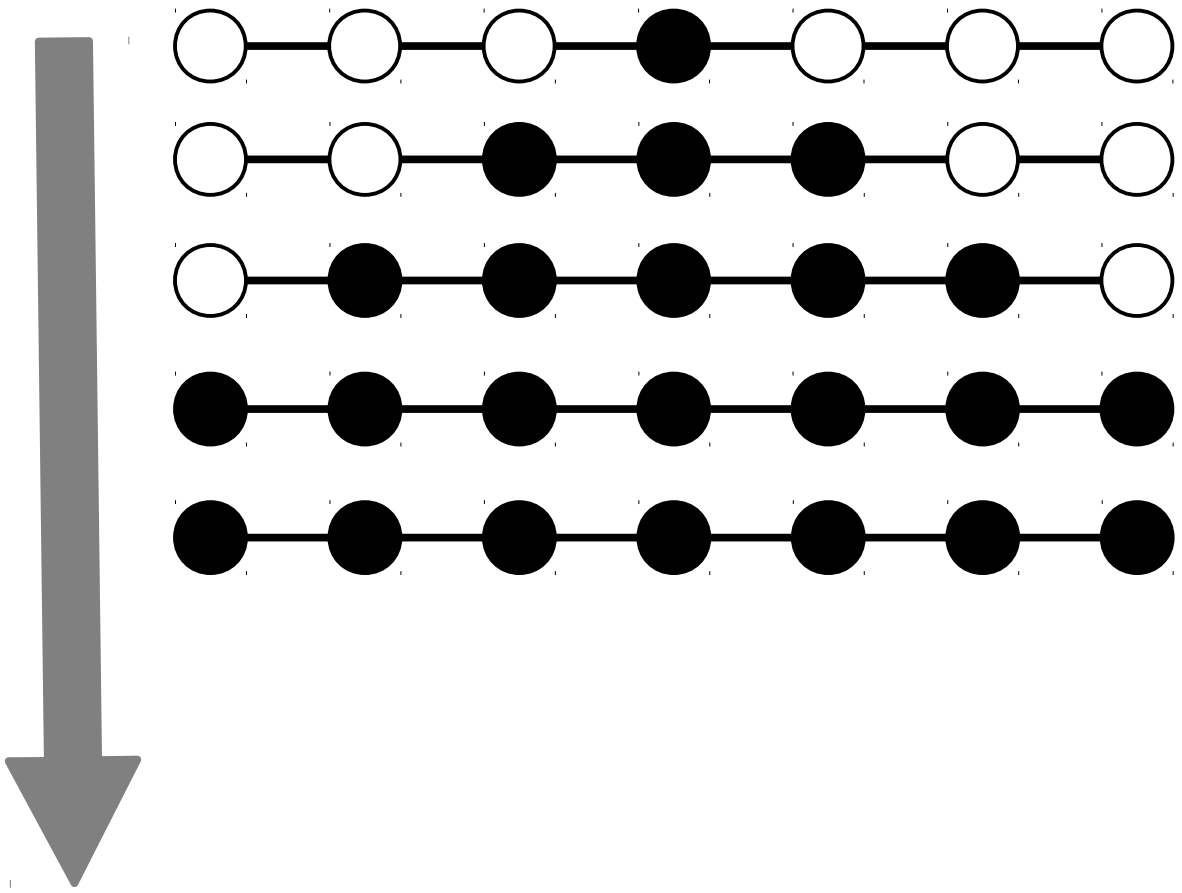

Demand 1/4

Demand 1/2

Demand 3/4

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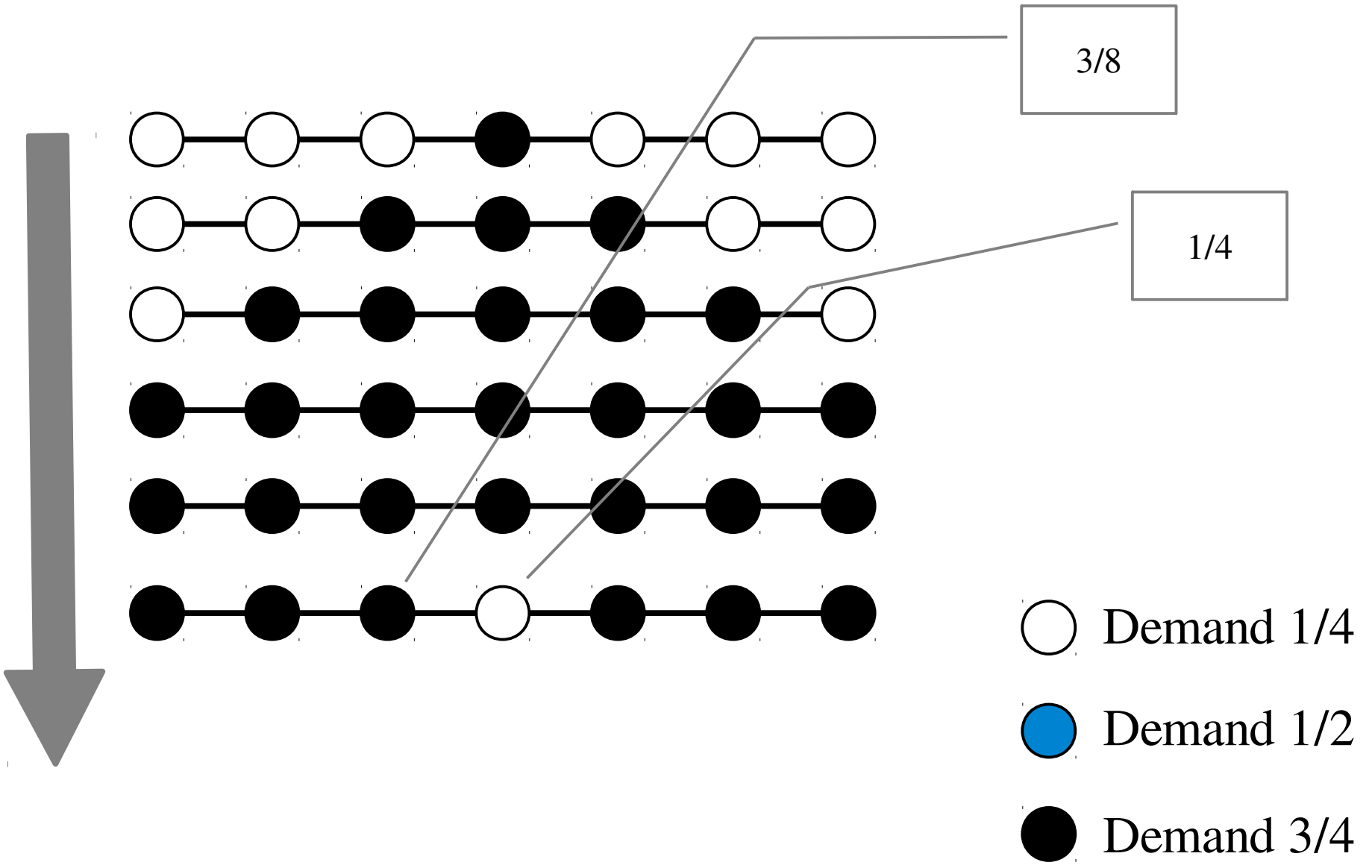

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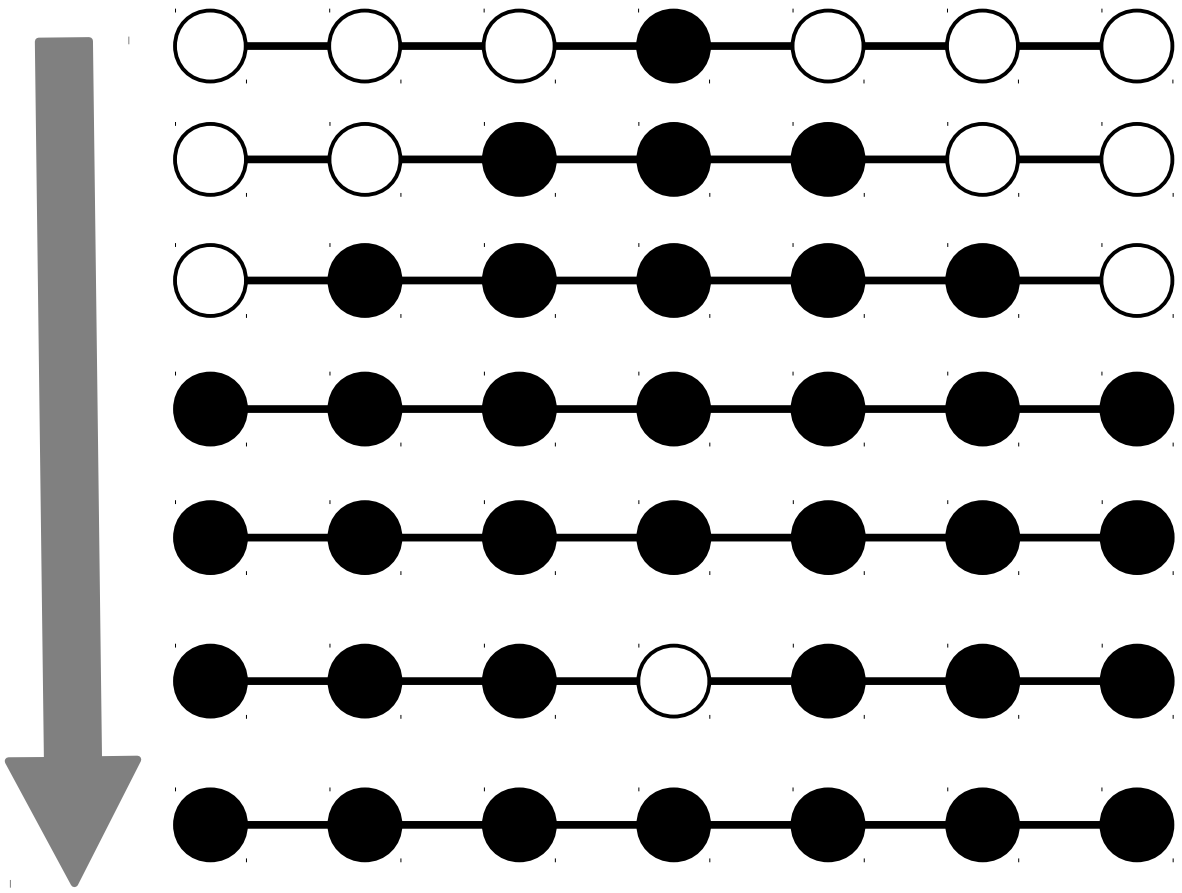

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Demand 3/4

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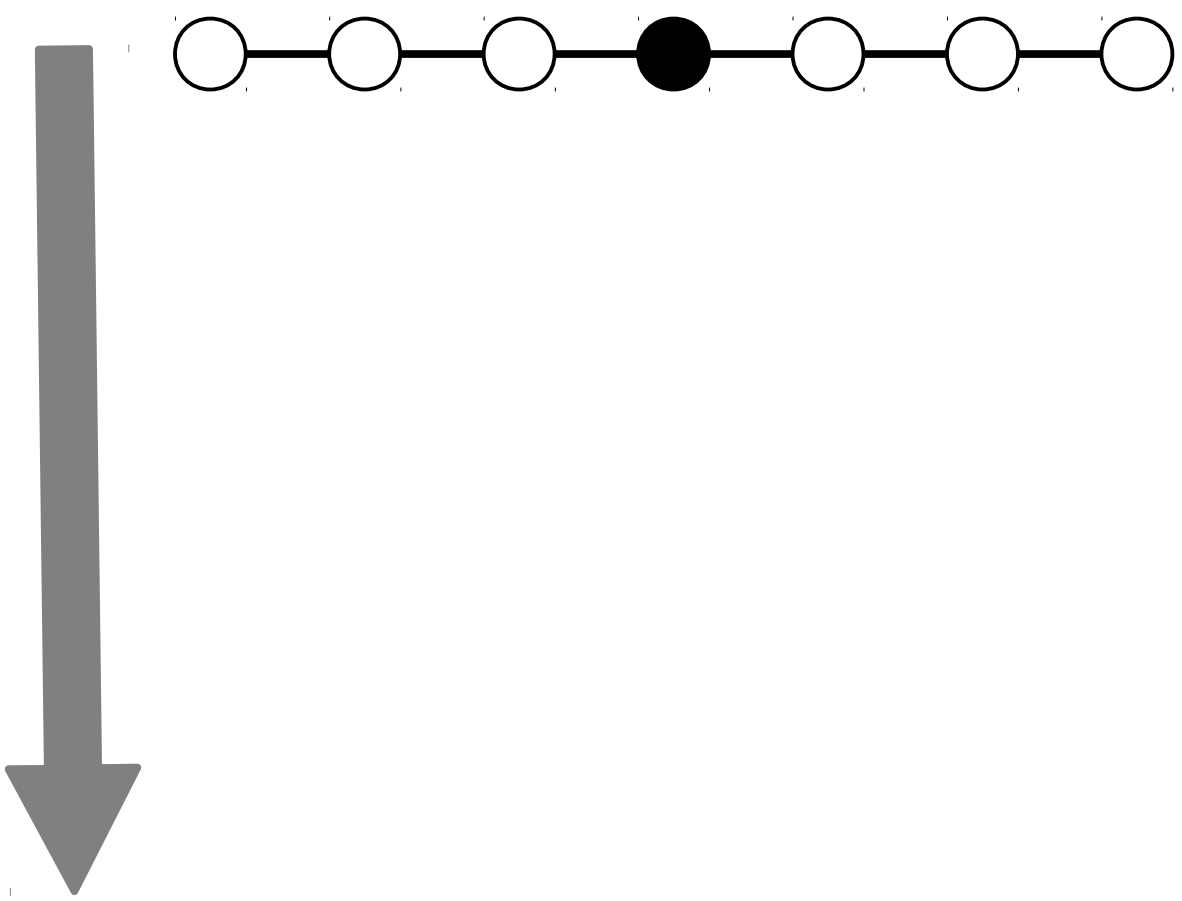
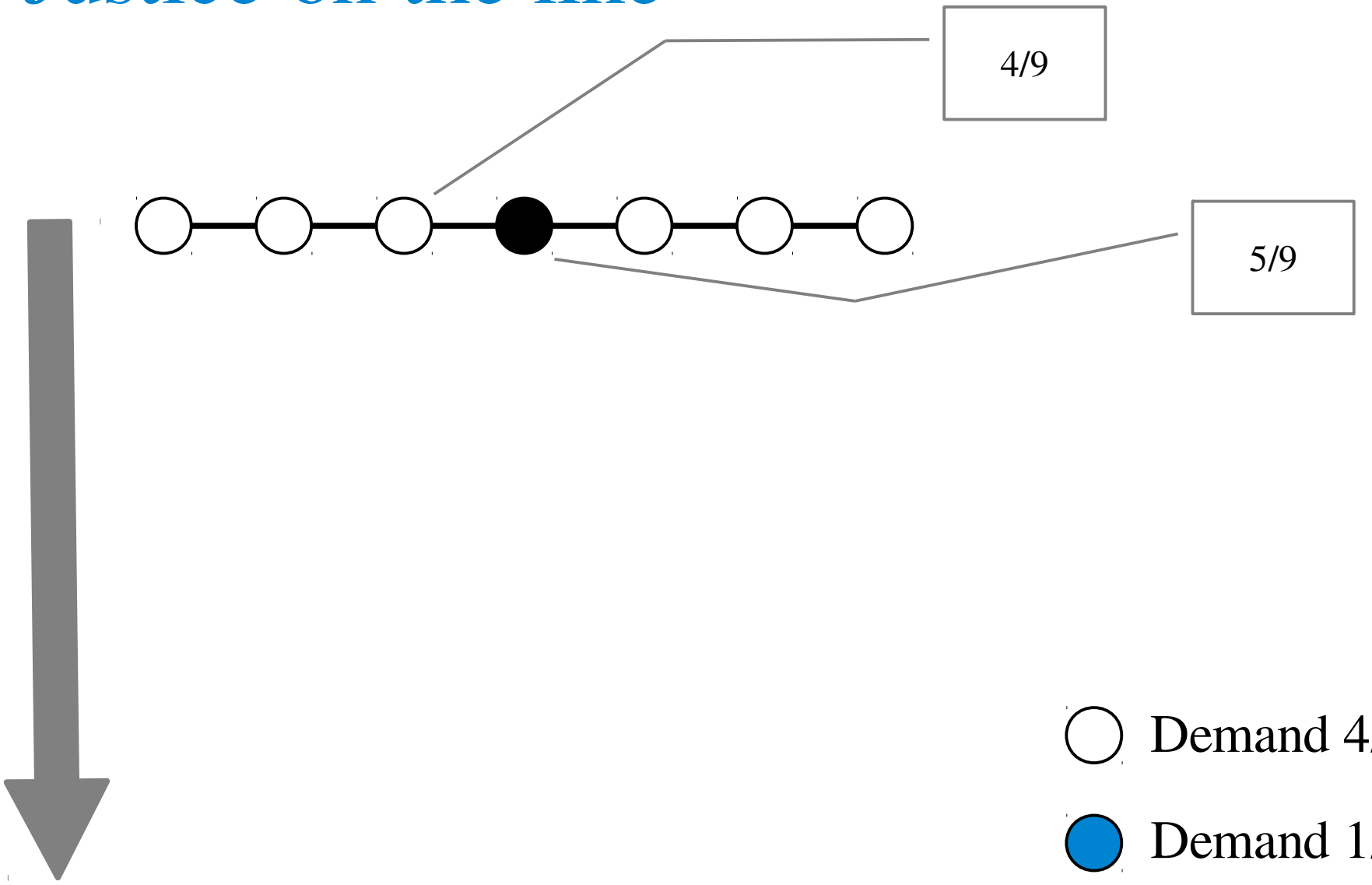


Demand 4/9

Demand 1/2

Demand 5/9

Justice on the line



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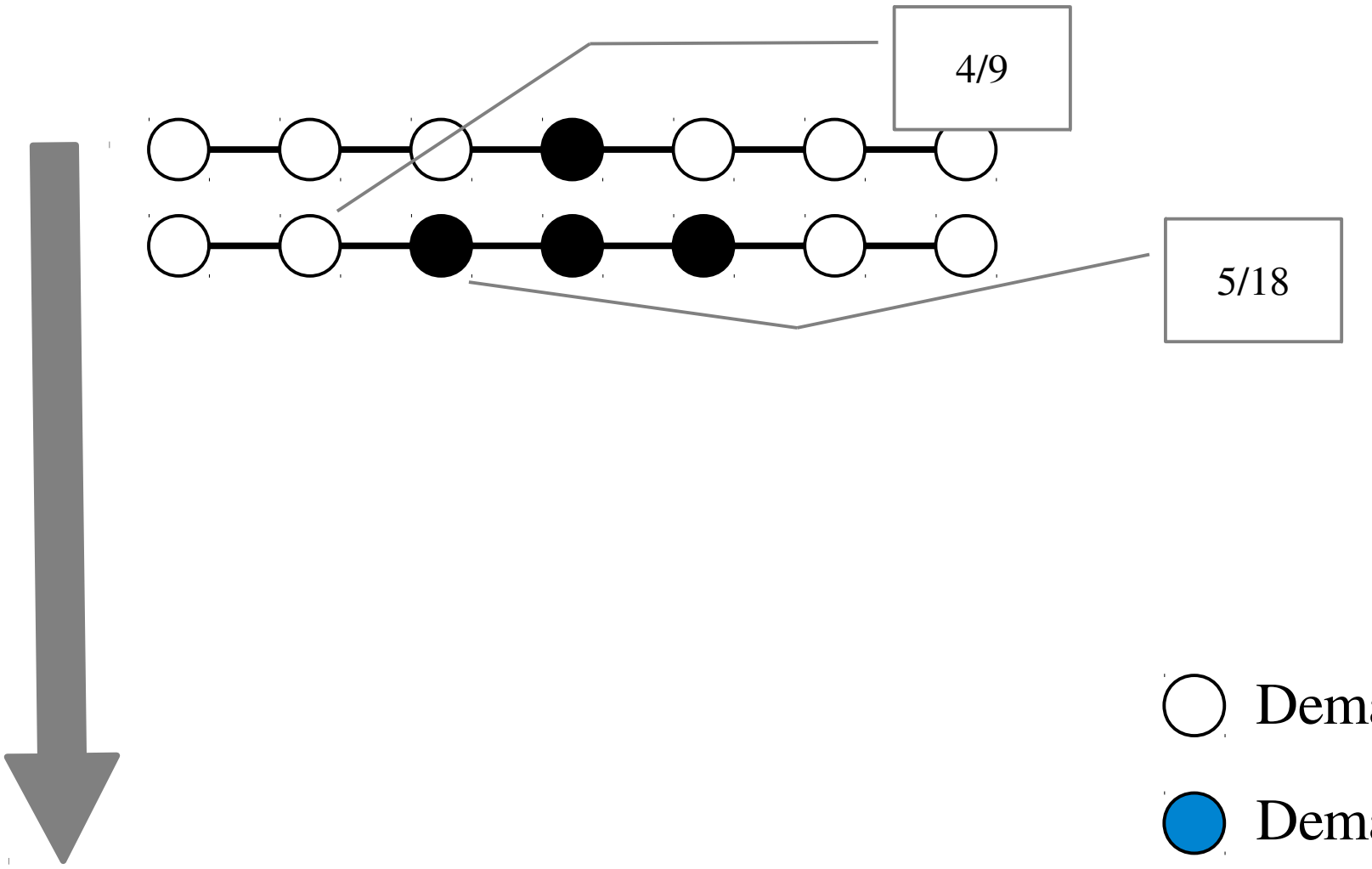

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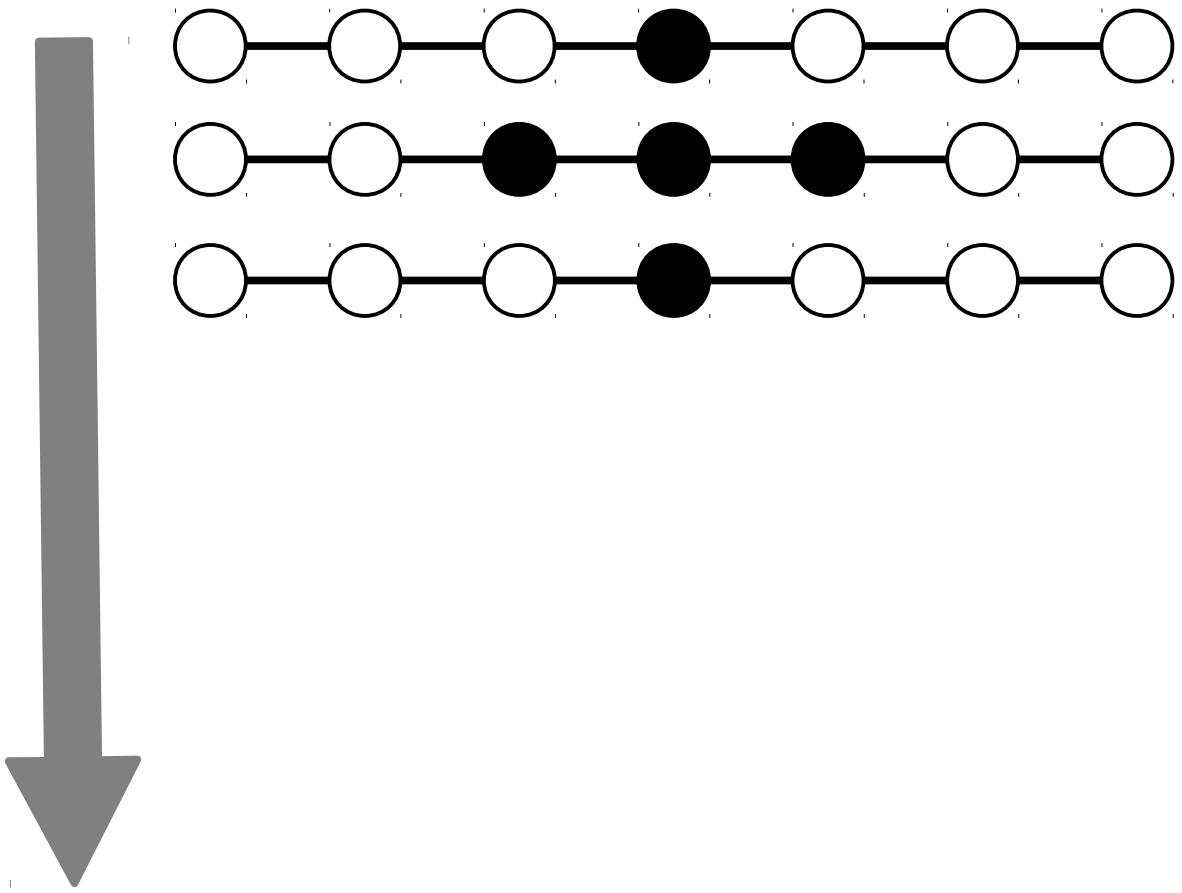

Demand 4/9

Demand 1/2

Demand 5/9

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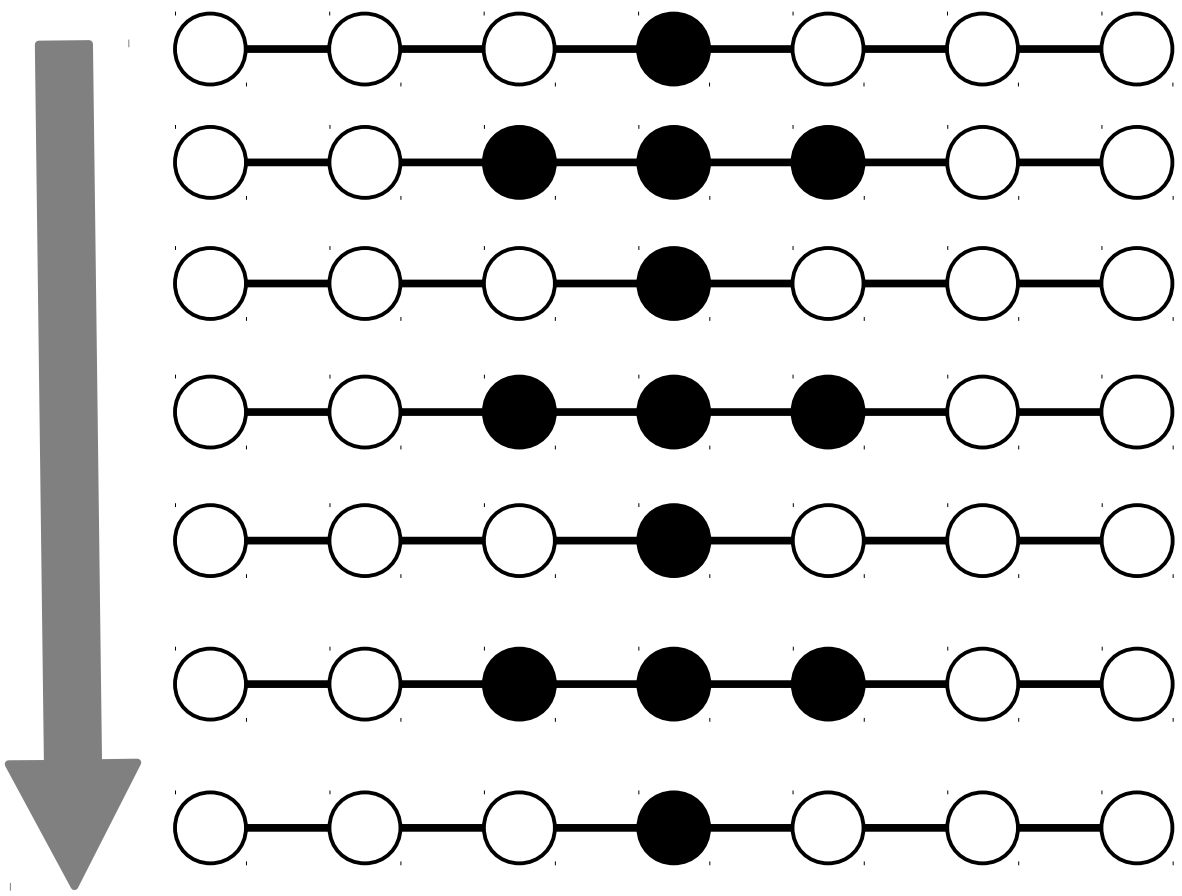

Demand 4/9

Demand 1/2

Demand 5/9

Extending fairness

- Utility might include a desire to meet other's expectations
- How would this influence the evolution of fairness?

Beyond fairness

- Norms of mutual cooperation (Skyrms, Alexander)

- Norms of abuse of subservience (O'Connor and Bruner)

Conclusions

- Social networks increase the number of possible end states
- Simultaneously, they make fairness more likely to evolve and be stable
- They provide more insight into how we have come to adopt the ½ norm